Family, Friends, and Romantic Partners' Influence on Mental Health Recovery among Emerging and Middle-aged Adults with Serious Mental Illness

By

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Abstract

Emerging adults refer to young people between the ages of 18 to 29 according to the theory of emerging adults. Scholars now recognize that emerging adults with serious mental illness (SMI) are at a distinctive developmental stage and thus their services and support needs are distinguished from children or older adults with SMI. However, evidence-based and developmentally appropriate mental health programs, particularly for emerging adults with SMI, are lacking.

The purpose of this study is to explore the distinctiveness of emerging adults with SMI. Guided by the social convoy model and the multidimensional model of mental health recovery, this study compared the differences in the social relational characteristics and their influences on mental health recovery between emerging (n=149) and middle-aged adults with SMI (n=296) using the National Survey of American Life.

The findings suggest that emerging adults with SMI are different from middle-aged adults with SMI in a few ways; however, they also have many similarities in terms of the social relational characteristics and their influences on mental health recovery. First, regarding the social relational characteristics of emerging adults with SMI, emerging adults with SMI had more negative interactions with family, more positive support from friends, and more negative interactions with romantic partners than middle-aged adults with SMI, though these differences in social relationships were not statistically significant after adjusting for sex, race, income level, and number of years since the onset of SMI. Second, regarding the role of social relationships in mental health recovery, the influence of family was different for emerging and middle-aged adults with SMI. Positive support from family was statistically significantly associated with the mental health recovery of emerging adults with SMI while negative interactions with family

were statistically significantly associated with the mental health recovery of middle-aged adults with SMI. However, positive support from friends was statistically significantly associated with the mental health recovery of both emerging and middle-aged adults with SMI. This study has further discussed implications for theory, empirical mental health research, and social work practice. Limitations and suggestions for future research are also discussed.

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Chapter 1: Introduction

Mental health of emerging adults, usually defined as young people aged 18 to 29, has received attention by policymakers and social work scholars for the last 10 to 15 years (Delman, Clark, Eisen, & Parker, 2015; Government Accountability Office (GAO), 2008). Scholars now recognize that emerging adults with mental health conditions are at a distinctive developmental stage and thus their services and support needs are distinguished from children or older adults with mental health conditions (Davis & Vander Stoep, 1997; Gilmer, Ojeda, Fawley-King, Larson, & Garcia, 2012; Manteuffel, Stephens, Sondheimer, & Fisher, 2008). However, evidence-based and developmentally appropriate mental health programs, particularly for emerging adults with mental health conditions, are critically lacking (Davis, 2003; Klodnick et al., 2015).

Social relationships, such as relationships with family or friends, are a core ingredient of many programs that support people with serious mental illness (SMI) (Drake, Green, Mueser, & Goldman, 2003). Many psychosocial programs aim at building trusting relationships with family, friends, and professionals, and these programs have reported effectiveness in improving mental health outcomes (e.g., Herz & Marder, 2002; Hogarty, 2002; Newlin, Webber, Morris & Howarth, 2015).

The understanding of social relationships in emerging adulthood is essential for the development of evidence-based and developmentally appropriate mental health programs for emerging adults with SMI (Norman, Windell, Manchanda, Harricharan, & Northcott, 2012). However, the characteristics and the role of social relationships in mental health recovery, particularly for emerging adults with SMI, is not yet well known. Many studies have examined

the role of social relationships in mental health recovery, but these studies have been conducted using samples of people with SMI of all ages, with little attention to the developmental stages.

In this regard, the overall goal of this study is (a) to explore the social relational characteristics of emerging adults with SMI and (b) to explore the influence of social relationships on mental health recovery among emerging adults with SMI. In doing so, this exploratory study compares emerging adults with SMI with middle-aged adults with SMI regarding the social relational characteristics and the association of social relationships and mental health recovery. Middle-aged adults with SMI were selected for comparison because the previous literature on social relationships and mental health recovery has been conducted using samples of middle-aged adults with SMI.

Considering the limitations of this study, to be explained further in chapters three and five, this is an exploratory study. Yet this study makes an important contribution given that the current psychosocial programs are likely developed based on studies without special attention to emerging adults. The distinctiveness of emerging adults with SMI identified in comparison with middle-aged adults with SMI can inform current and future programs about what to adapt to better support emerging adults with SMI. This is the first study to conduct such a comparison and therefore it opens new avenues for future research and innovation in mental health services.

This dissertation consists of five chapters. Chapter 1 defines the population, emerging adults with SMI, by explaining their distinctive characteristics and unique challenges. A review of existing programs designed for emerging adults with SMI is also presented to understand the current efforts to support emerging adults with SMI. Chapter 2 develops a rationale for this study by reviewing the theoretical and empirical literature pertaining to social relationships and mental health recovery and by identifying limitations and gaps in the literature. Chapter 3 establishes

research questions and associated hypotheses as well as the methodology for the study. Chapter 4 presents findings of the current study. Finally, Chapter 5 discusses the main findings along with its implications for theory, empirical mental health research, and social work practice. Limitations and suggestions for future research are discussed.

Emerging adults with SMI

Defining the population. Emerging adults refer to young people between the ages of 18 to 29 according to the theory of emerging adults (Arnett, 2000; Arnett, Žukauskienė, & Sugimura, 2014). Arnett (2000) proposed the concept of emerging adults to emphasize the distinctive developmental characteristics of young people in this period. In most industrialized societies, normative adult roles such as finding a job or forming a family that previously took place in the late teens or early twenties are now often occurring in the late twenties or early thirties (Arnett, Kloep, Hendry, & Tanner, 2010). Due to this delayed transition to normative adult roles, young people nowadays often feel that they have left adolescence, but they do not yet feel that they have reached adulthood (Arnett, 2000; Nelson & Barry, 2005). Unlike adolescents, emerging adults do not likely experience puberty, likely graduate from high school, and are no longer minors by the law in the United States. However, they also do not likely have set up yet a stable life structure as adults (Arnett et al., 2014).

Arnett et al. (2014) explained that emerging adults are distinguished from adolescents and adults in later ages and identified five distinctive features of emerging adults. These include “identity explorations,” “instability,” “feeling in-between,” “self-focus,” and “possibilities and optimism.” During the period of emerging adulthood, young people explore various possibilities in romantic relationships, jobs, and ideology, which often leads to frequent changes of romantic partners, jobs, residence, and even self-image. Feeling depressed or anxious is common in

emerging adulthood. Emerging adults do not feel a sense of belonging to adolescents or adults, as characterized by the term “feeling in-between.”

However, not all features in emerging adulthood are negative. Self-focus, and possibilities and optimism are the positive features of emerging adulthood. Emerging adulthood is a time of life that people have the fewest obligation to others. In many cases, emerging adults still maintain relationships with parents, but do not have to respond to the demands of parents. They may have a job, but likely with fewer responsibilities and obligations. This helps emerging adults have time to develop skills that are necessary for their future and gain a better understanding of who they are and what they want to be. Most importantly, emerging adults tend to be optimistic. Emerging adults are more likely to have high hopes in recognition of the potential for dramatic changes. For example, emerging adults who have grown up in an unhappy family can overcome the situation by setting new life away from the original family. In fact, in a national survey of 1,029 people aged 18 to 29 in the United States, 89% agreed with the statement “I am confident that eventually, I will get what I want out of life”, and 77% agreed with the statement “I believe that, overall, my life will be better than my parents’ lives have been” (Arnett et al., 2014).

Challenges of emerging adults with SMI. However, emerging adulthood is also the period in which SMI typically begins to manifest (Patel, Flisher, Hetrick, & McGorry, 2007). Psychotic disorders, especially schizophrenia, have a peak age of onset between ages 15 and 25 (Kessler et al., 2007). Also, the median age of onset for mood disorders (age 30 years) is around this period (Kessler et al., 2005). In fact, the GAO estimated that at least 2.4 million young adults aged 18 to 26 in the United States population, or 6.5% of the total population in that age range, have SMI (GAO, 2008). The definition of SMI in this dissertation follows the Substance Abuse

and Mental Health Services Administration (SAMHSA)'s definition of Serious Mental Illness for those ages 18 and over (SAMHSA, 2016):

> "Having, at any time during the past year, a diagnosable mental, behavior, or emotional disorder that causes serious functional impairment that substantially interferes with or limits one or more major life activities. Serious mental illnesses include major depression, schizophrenia, and bipolar disorder, and other mental disorders that cause serious impairment." (SAMHSA, 2016, para 8).

Emerging adults with SMI may face more difficulties in accomplishing developmental tasks than their peers without SMI (Davis & Vander Stoep, 1997; Walker & Gowen, 2011). A national survey revealed that the rate of high school completion among youth with SMI was not significantly different from those without SMI (Wagner & Newman, 2012). However, the rate of post-secondary education enrollment was only about half the rate of the general population (34.7% versus 62.6%). In terms of a four-year college enrollment, specifically, only 11% of emerging adults with SMI had attended a four-year college, compared to 40.2% of emerging adults in the general population. Further, emerging adults with SMI were less likely to be employed and more likely to be involved in the criminal justice system. The research showed that 60.5% of emerging adults with SMI had been arrested at some point in time and 44.3% had been on probation or parole (Wagner & Newman, 2012).

Unfortunately, the current mental health systems seem not adequate to support emerging adults with SMI. The research on mental health service utilization revealed that emerging adults are the age group that uses mental health services the least (Pottick, Bilder, Vander Stoep,

Warner, & Alvarez, 2008). This is perhaps due in part to the lack of services that are developmentally appropriate for emerging adults with SMI (Gilmer et al., 2012). According to the 2010 National Mental Health Services Survey, only 30.1% of 9,139 mental health facilities in the United States offered treatment programs designed for young people aged 18 to 25 (Center for Behavioral Health Statistics and Quality, 2015).

Programs that support emerging adults with SMI. Several programs have been developed specifically for emerging adults with SMI. Based on the positive youth development perspective, it is believed that developing a positive identity, acquiring the capacity, motivation, and self-control, and developing supportive relationships and connections are critical not only to the developmental transition but also the mental health recovery of emerging adults with SMI (Walker & Gowen, 2011). The Transition to Independence Process (TIP) model, for example, provides emerging adults with SMI the opportunity to explore their current interests and future goals in the areas of employment and career, education, living situation, personal well-being, and community-life functioning (Clark, 2004). According to the TIP system development and operations manual, the seven guidelines of the TIP model include

1. Engage young people through relationship development, person-centered planning, and a focus on their futures.
2. Tailor services and supports to be accessible, coordinated, developmentally-appropriate, and build on strengths to enable the young people to pursue their goals across all transition domains.
3. Acknowledge and develop personal choice and social responsibility with young people.

4. Ensure a safety-net of support by involving a young person's parents, family members, and other informal and formal key players.
5. Enhance young persons' competencies to assist them in achieving greater self-sufficiency and confidence.
6. Maintain an outcome focus in the TIP system at the young person, program, and community levels.
7. Involve young people, parents, and other community partners in the TIP system at the practice, program, and community levels. (Clark, 2004, pp.11-12)

The TIP model was implemented for youth aged 14 to 21 and showed effectiveness in the areas of educational advancement, employment, the criminal justice involvement, functional limitations related to mental health difficulties, and functional limitations related to substance use (Haber, Karpur, Deschenes, & Cark, 2008).

Given that obtaining a job is a normative developmental task in emerging adulthood, vocational support programs have been provided to emerging adults with SMI. At the early years of vocational programs, emerging adults with SMI received the same forms of support with people with SMI in older ages (Burke-Miller, Razzano, Grey, Blyler, & Cook, 2012). Later, some efforts have been made to provide modified vocational programs tailed to emerging adults with SMI (Killackey, Jackson, & McGorry, 2008). For example, Ellison et al. (2015) added the components of supported education, peer mentorship, and career development to the Individual Placement and Support (IPS) model. Over a 12-month period, nearly half of participants obtained a job or enrolled in an educational program. This outcome is lower than the competitive employment rate of other IPS evaluation studies in older generations (e.g., Bond, Drake, &

Campbell, 2014), but researchers perceived it as still promising given the lower academic attainment and work experiences of the sample.

While the aforementioned programs seem promising in that they clearly recognize the importance of social relationships in successful developmental transition and the mental health recovery of emerging adults with SMI, it is still not sufficient. A recent review of programs critiqued that the programs currently available to emerging adults with SMI are not well incorporating the developmental distinctiveness of emerging adults in terms of social relationships (Di Rezze et al., 2017). It revealed that most of the programs were targeting work-related outcomes of emerging adults with SMI. Programs including a component addressing personal or interpersonal issues of emerging adults with SMI were lacking.

Recognizing the importance of early interventions, efforts have been given throughout the world to develop effective programs for people who are in the early stages of psychosis (Addington & Addington, 2001; Nordentoft, Rasmussen, Melau, Hjorthøj, & Thorup, 2014; Petersen et al., 2005). These programs can be important options for emerging adults with SMI as well because people in the early stages of psychosis are likely in emerging adulthood. In the United States, Recovery After an Initial Schizophrenia Episode (RAISE) was initiated in 2008 by the National Institute of Mental Health (NIMH), and the NAVIGATE program was developed as part of the RAISE initiative (Mueser et al., 2015).

NAVIGATE is a coordinated specialty care program for people who have experienced a first episode psychosis (FEP) and consisted of four core interventions, including individualized medication management, family education program, individual resiliency training, and supported employment and education (http://navigateconsultants.org/). NAVIGATE seems effective in helping with the recovery of people with FEP. A two-year outcomes study showed that

NAVIGATE participants, compared to those in usual community care, remained in treatment longer, had improved quality of life, and reported reduced psychiatric symptoms (Kane et al., 2015).

NAVIGATE has many promising features that could be beneficial to emerging adults with SMI. NAVIGATE includes supported employment and education, and family education program as core interventions. Given that completing education and finding a job are important life tasks for emerging adults with SMI, and that emerging adults with SMI are likely living with or in regular contact with family members, NAVIGATE addresses the major needs of emerging adults with SMI. However, the developmental characteristics are not at the center of NAVIGATE. For example, the age criterion for eligibility is often between ages 15 and 40, and the type of diagnosis and the history of antipsychotic medication or treatment are often considered more importantly in the program (Mueser et al., 2015).

Rationale and purpose of the study

The period of emerging adulthood is critical for emerging adults with SMI for clinical and developmental reasons. Clinically, this period is likely the early years of experiencing mental illness, and it is known that early intervention can minimize the adverse impact of mental illness. Evidence suggests that most symptomatic and psychosocial deterioration progress rapidly during the first two to five years after the onset (Birchwood, Todd, & Jackson, 1997; Crumlish et al., 2009); and early detection and prompt interventions during this period are more effective than later interventions (Larsen et al., 2001; Malla, Norman, & Joober, 2005). Developmentally, emerging adulthood can be a significant turning point. Scholars maintain that successful transition into adulthood during emerging adulthood significantly impacts later adult life

(Schulenberg, Sameroff, & Cicchetti, 2004). The influence of childhood adversity can be reversed by positive emerging adulthood experiences (Schulenberg, Bryant, & O'malley, 2004).

Social relationships can be a key to support emerging adults with SMI. The beneficial role of social relationships in mental health recovery of people with SMI is well known (Deegan, 1997; Onken, Craig, Ridgway, Ralph, & Cook, 2007). Accordingly, many social work practices have incorporated supportive relationships in their efforts helping people with SMI. For example, supportive relationships are a central focus of the Strengths Model Case Management (SMCM). The strengths assessment, one of the primary tools in the SMCM, assesses supportive relationships as one of seven life domains that are meaningful and important to achieve their identified personal recovery goals (Rapp & Goscha, 2012). Further, many developmental psychologists emphasize the role of social relationships in positive child and adolescent development (Lerner, 2005). Indeed, social relationships are at the core of social work profession's values. The Code of Ethics of the National Association of Social Workers (2017) states that

> Social workers recognize the central importance of human relationships. Social workers understand that relationships between and among people are an important vehicle for change. Social workers engage people as partners in the helping process. Social workers seek to strengthen relationships among people in a purposeful effort to promote, restore, maintain, and enhance the well-being of individuals, families, social groups, organizations, and communities (NASW, p.6).

In sum, interventions during emerging adulthood can make a significant difference for the well-being of emerging adults with SMI, and social relationships can be a critical venue of these interventions (Norman et al., 2012).

Unfortunately, the developmental distinctiveness of emerging adulthood receives little attention as Chapter 2 will discuss. Despite some available interventions, many emerging adults with SMI and their parents report that adult mental health services were not helpful during the transition period (Paul, Street, Wheeler, & Singh, 2014). Interventions that are not originally developed for emerging adults with SMI are still offered to this population (Bond et al., 2014). In addition, community mental health centers providing such services are often dominated by middle-aged or older adults. Emerging adults using services from these community mental health centers often perceived that such programs do not fit their youth culture (Walker & Gowen, 2011).

Interventions would likely be more effective when it is tailed to the emerging adults' developmental characteristics. A better understanding of how social relationships are related to the life of emerging adults with SMI is needed for social work researchers and practitioners to identify appropriate venues for interventions. However, previous research has been conducted using samples of people with SMI of all ages, predominantly middle-aged adults with SMI. Developmental needs of emerging adults with SMI have been ignored in the current mental health literature. In this regard, this study (a) explore the social relational characteristics of emerging adults with SMI and (b) explores the association between social relationships and mental health recovery among emerging adults with SMI by comparing with middle-aged adults with SMI. Given a lack of empirical studies that directly compare emerging adults with SMI with

middle-aged adults with SMI, this exploratory study will shed light on the developmental distinctiveness of emerging adults with SMI.

Chapter summary

This chapter discussed the reason why the social work profession needs to focus on emerging adults with SMI. Emerging adults with SMI face dual challenges related to their clinical and developmental needs. Clinically, emerging adulthood coincides with the period in which a major mental illness begins to manifest. Developmentally, emerging adults with SMI face more difficulties in accomplishing developmental tasks because of functional limitations triggered by mental illness. Several programs have been developed specifically for emerging adults with SMI. However, the current mental health systems seem not adequate to support emerging adults with SMI.

Social relationships are a core ingredient of interventions and in line with the social work professional mission. A better understanding of social relationships among emerging adults with SMI will guide social work researchers and practitioners to identify appropriate venues for interventions. The next chapter reviews the theoretical and empirical literature to provide the foundation for this study.

Chapter 2: Literature Review

This chapter provides a review of theoretical and empirical literature pertaining to social relationships and the role of social relationships in the mental health recovery of emerging adults with SMI. The convoy model of social relationships serves as a theoretical framework to understand the social relational characteristics of emerging adults with SMI. The main premise of the convoy model is that social relationships surrounding individuals change over the life course, and its relative importance differs by life stages. The next section of theoretical literature introduces the literature around mental health recovery. A modern recovery paradigm emphasizes the multidimensionality of mental health recovery and values social relationships as a critical contributor to recovery. Next, a review of empirical literature is conducted to understand the current body of knowledge on the social relationships and the mental health recovery of emerging adults with SMI. Overall, the previous empirical research exploring the influence of social relationships on mental health recovery tends to overlook the developmental characteristics of people with SMI. Some qualitative studies explored the conceptualization of mental health recovery and the role of social relationships in the mental health recovery of emerging adults with SMI. However, very few quantitative studies explored social relationships and mental health recovery particularly for emerging adults with SMI.

Theoretical literature

The social convoy model. The social convoy model holds that people maintain networks of social relationships that provide social support and influence well-being, and that the relative importance of these social convoys change over the life course (Kahn & Antonucci, 1980; Levitt, 2005; Wrzus, Hänel, Wagner, & Neyer, 2013). Kahn and Antonucci (1980) categorized the social convoy into the three levels of inner, middle, and outer circle, depending

on the closeness and importance of relationships and defined inner circle relationships as “so close and important to you that it is hard to imagine life without them,” middle circle relationships as “not quite that close, and less close, but still important,” and outer circle relationships as “not as close as the others, but who are still important – people you still really love or like, but not quite as much as the people in the middle circle” (Antonucci, Akiyama, & Takahashi, 2004, p. 354; Levitt, Guacci-Franco, & Levitt, 1993).

Influenced by the attachment theory and the life-course perspective, Kahn and Antonucci (1980) explained that people begin to develop the convoys by interacting with the core attachment figures like parents during infancy. Later, the composition and hierarchy of social convoys continue to change because of external circumstances that people experience across the life courses. The external circumstances that influence social convoy can be both normative and non-normative (Levitt, 2005; Wrzus et al., 2013). Normative life events are related to maturation and aging that most people expect to experience with a high probability such as marriage, entering and graduating school, and finding a job. Non-normative life events are experiences that only few people are likely to have and the timing of those events vary by people (Brim & Ryff, 1980). No inherent positive or negative meaning is attached to any of normative and non-normative life events. Death is an example of negative normative life events and winning the lottery is an example of positive non-normative life-events.

The development of convoys begins in infancy but expands to include other important relationships throughout the life courses (Levitt, 2005; Levitt, Silver, & Santos, 2007). Even in the case that one particular type of relationship (e.g., family) remains for a lifetime, changes continue to occur during the life-course regarding which relationships make the biggest contribution to one’s well-being (Ruehlman & Wolchik, 1988). The next section introduces the

social convoys known to be important to the well-being of emerging adults in the general population.

Convoys of emerging adults. Entering emerging adulthood is also a normative life event, changing the composition and hierarchy of social convoys. Emerging adults are likely to have multiple forms of relationships including family, peers and friends, and romantic partners, and such relationships continue to change during this period in life. These relationships are interrelated such that emerging adults with higher levels of perceived family support are likely to have higher levels of perceived friends or romantic partner support (Pettit, Roberts, Lewinsohn, Seeley, & Yaroslavsky, 2011). Nevertheless, certain forms of relationships are particularly important in satisfying social needs of a certain stage (e.g., Erikson, 1994; Furman & Wehner, 1994; Sullivan, 1953). The following section summarizes the convoys of emerging adults in general, which include family, friends, and romantic partners.

Family. Family relationships, including relationships with parents, siblings, and extended family members (e.g., grandparents and relatives), are in many cases the most important human relationships (Kahn & Antonucci, 1980). Even though it is shown that the importance of parents will be reduced as their children seek autonomy and independence during adolescence, the importance of relationships tends to bound back in emerging adulthood (Furman & Buhrmester, 1992; Levitt et al., 2007; Tsai, Telzer, & Fuligni, 2013). Emerging adults, especially from European backgrounds, turned to their parents increasingly more for help, advice, sympathy, and cheering up in the years after high school (Guan & Fuligni, 2015). This may be related to the fact that the structured time spent with peers may decrease as most of emerging adults graduate from high school (Sherman, De Vries, & Lansford, 2000). In addition, adult children often come to understand and appreciate their parents as they share similar experiences during the early stage

of adulthood (Aquilino, 1997). In fact, family members were identified as the most meaningful relationships in their life among college students when they were asked on a survey to indicate the most significant contributor to personal meaning in life (Lambert et al., 2010).

Family relationships are strongly linked to the well-being of emerging adults (Antonucci & Cantor, 1994). Levitt et al. (2007) showed that increases in family relationship satisfaction during the transition into adulthood were related to better transitional outcomes of emerging adults. Also, emerging adults with higher perceived support from their family were likely to have a lower risk of depression (Pettit et al., 2011) and increased self-esteem (Guan & Fuligni, 2015).

Friends. Developmentally, the influence of peers and friends rises in adolescence. Peers are considered to be important sources of relationships to adolescents and emerging adults (Erikson, 1968). Friend relationships are the center during adolescence and emerging adulthood as people in this age group usually seek independence from their original family (Flynn, Felmlee, & Conger, 2014; Parks, 2006). Yet, as emerging adults graduate high school and/or transit from adolescence to emerging adulthood, it is likely the case that many school-based friendships end or at least change due to physical separations or different life goals (Paul & Brier, 2001). Nevertheless, scholars maintain that peers often take over the role as primary attachment figures in emerging adulthood (Fraley & Davis, 1997) and play a role in need fulfilment (Carbery & Buhrmester, 1998).

Researchers have documented the benefits of friendships in emerging adulthood. College students' peer relationships were related to their adjustment to college (Fass & Tubman, 2002; Lapsley & Edgerton, 2002). Specifically, increased peer support over the first two semesters of college predicted improved social and emotional/personal adjustment (Friedlander, Reid, Shupak, & Cribbie, 2007). The friendship quality was a significant predictor of academic

adjustment, social adjustment, emotional/personal adjustment, and institutional attachment (Swenson, Nordstrom, & Hiester, 2008). In addition, low peer support of emerging adults predicted the onset of depression (Eberhart & Hammen, 2006). Emerging adults who had harmonious relationships with same-gender friends reported low loneliness and high self-esteem (Sherman, Lansford, & Volling, 2006). However, the role of peer or friend relationships can be ambivalent as not all friendships are rewarding. Peer pressure is often reported as a contributor to reckless substance use, reckless sex, reckless driving, and other risk taking behaviors (Bradley & Wildman, 2002).

Romantic partners. Formation and maintenance of romantic relationships are central to the lives of emerging adults (Arnett, 2000). Romantic partners have a unique status in social relationships as they function as not only family members but also friends. A longitudinal study comparing adolescents' and emerging adults' perception on romantic partners revealed that the importance of romantic partners, as compared to friends, increases over time (Meeus, Branje, van der Valk, & de Wied, 2007). Yet, not all romantic relationships are equally important; rather, their importance differs significantly depending on the quality and the length of relationships (Fraley & Davis, 1997; Pitman & Scharfe, 2010). Several studies showed that emerging adults with long-term romantic relationships were more likely to prefer their partners and less likely to prefer their friends for their support needs, but there was no difference as compared to parents (Aquilino, 1997; Carbery & Buhrmester, 1998; Furman & Wehner, 1994; Umemura, Lacinová, & Macek, 2015).

Romantic relationships of emerging adults have been studied in relation to psychological well-being. For example, the quality of romantic relationships was negatively associated with depression (Whitton & Kuryluk, 2012). Specifically, Whitton and Kuryluk (2012) revealed that

emerging adults, particularly among female emerging adults, those with greater relationship satisfaction had lower depressive symptoms. Further, for both male and female emerging adults, various components of romantic relationship quality (i.e., commitment, satisfaction, romance, love, trust, sexual activity, and intimacy) were positively correlated with subjective well-being, and negatively correlated with psychological distress and depressive symptoms (Love & Holder, 2016).

The relative importance of social convoys among emerging adults in the general population. Although family, friends, and romantic partners are all important sources of relationships for emerging adults, their relative importance may differ from adults in other developmental stages. To date, a few studies have investigated the distinctiveness of emerging adults in terms of their social convoys by comparing them with people in other developmental stages. Levitt, Weber, and Guacci (1993) compared emerging adult women (Mean age=21.7 SD=4.8), their mothers (Mean age=46.7, SD=6.3), and their grandmothers (Mean age=73.0, SD=8.4) in terms of the structure and the function of social networks based on the social convoy model. The results showed that all generations endorsed close family members frequently as inner circle members. Yet, emerging adult women named more friends in their inner circle while grandmothers named more family members. Specifically, emerging adult women had a mean of 5.3 close family members compared with 5.9 and 7.2 for mothers and grandmothers. For friends, emerging adult women reported 4.4 friends compared to 2.1 and 0.9 friends for mothers and grandmothers. In addition, the amount of support received from family and friends differed. Emerging adult women reported they received less support from family and more support from friends compared to older generations.

The differential patterns in the quantity and quality of social convoys were observed in terms of negative influence of social convoys as well. Walen and Lachman (2000) studied social support and strain from family, friends, and romantic partners using the national probability sample of 3,485 adults (665 emerging adults aged 25 to 39; 927 middle-aged adults aged 40 to 59; and 368 older adults aged 60 to 75). They found that emerging adults reported less family support, and more family and friend strain compared with older adults. In terms of romantic partners' impact, there were interactions of sex and age. Emerging adult men reported higher partner support than middle-aged men but lower than older mem. For women, however, partner support was stable across age groups.

More recently, a meta-analysis of 277 studies with the total number of 177,635 participants was conducted (Wrzus et al., 2013). They analyzed the size of global network (i.e., total number of social networks), personal network (i.e., total number of people "providing" support including family, friends, and others), family network (i.e., number of family supporters), and friends (i.e., number of non-family supporters) network across ages. The results revealed that emerging adults reported more social network members than adolescents. Beyond emerging adulthood, however, the global network started to decrease until ages 60 to 65. The size of both personal and friendship networks became smaller while the size of family networks showed relatively no difference.

Key factors that are related to social convoys. The social convoy model explains that the changes in the social convoys of individuals are largely related to external circumstances. However, researchers have shown that the development of social convoys can also vary by gender and culture, even with the same external circumstances (Levitt, 2005; Wrzus et al., 2013).

Gender variation in the development of social convoys. Males and females likely exhibit different social convoys as gender role norms can affect perceptions of available support and a willingness to seek help (Barbee et al., 1993). Indeed, studies have shown that females tend to list more significant others in their lives (Blyth, Hill, & Thiel, 1982), report higher rates of support overall from family and peer sources (Carbery & Buhrmester, 1998; Furman & Buhrmester, 1992; Pettit et al., 2011), and rate the importance of having these relationships higher than males (Furman & Buhrmester, 1985).

Males and females differ in terms of the impact of social convoys as well. Overall, the influence of social relationships, including both positive (i.e., social support) and negative (i.e., social negativity), is generally stronger for females than males. In a longitudinal study of emerging adults transitioning from high school to college, Pettit et al. (2011) revealed that perceived support from family was negatively associated with depressive symptoms of emerging adults. Yet, such association was only statistically significant for females; women with higher levels of perceived family support at age 21 were less likely to develop higher levels of depressive symptoms through the age 30. The same pattern was reported in terms of romantic relationships. Love and Holder (2016) analyzed the mediation effect of romantic relationship quality in the association of psychological distress and subjective well-being. The results indicated that the mediation was moderated by gender; the mechanism linking romantic relationship quality, psychological distress, and subjective well-being was only confirmed for females.

Sexual orientation and identity may play a role in the development of social convoys. Lesbian, gay, bisexual, transgender, queer, questioning, and intersexed (LGBTQI) youth and emerging adults also present a unique pattern of social convoys compared to heterosexual youth

and emerging adults. LGBTQI youth and emerging adults suffer multiple ongoing stressors related to their sexual orientation, such as sexual orientation stigma, fear of rejection, and victimization (Munoz-Plaza, Quinn, & Rounds, 2002). Accordingly, peers become a major source of social support in this population. Indeed, a review of sexual-minority adult studies revealed that LGBTQI youths tend to come out to peers first, followed by sibling, and then mothers (Savin-Williams, 1998). While support from both family and friends is important to the level of depression and life satisfaction among LGBTQI youths and emerging adults (Sheets & Mohr, 2009), reliance to peers may play a particularly important role when LGBTQI emerging adults are rejected by their family (Goldfried & Goldfried, 2001).

C*ultural variation in the development of social convoys.* Cultural context influences social convoys as well. This can occur because people interpret self, others, and relationships in reference to their cultural values (Endo, Heine, & Lehman, 2000; Heine, Lehman, Peng, & Greenholtz, 2002). Latino culture, for example, has been understood as collectivist culture that values close family relationships and warm interactions within the social networks (Sabogal, Marín, Otero-Sabogal, Marín, & Perez-Stable, 1987). Latino people tend to socialize and exchange support with an extended family more so than non-Latino White people (Sarkisian, Gerena, & Gerstel, 2006), and they were more likely to offer help even to strangers (Levine, Norenzayan, & Philbrick, 2001). Scholars call this unique Latino cultural aspect “familialism” and insist that this familialism, pervasive in the Latino culture, creates the context that makes it easier for Latino people to perceive, obtain, and benefit from social support from their close relationships, especially family (Campos et al., 2008).

Asian culture, which is also considered as collectivist, shows unique social relationship dynamics, distinctive even from Latino culture (Kim, Sherman, & Taylor, 2008). Members in

Asian culture tend to refrain from seeking help and wait until others in the network provide help. In Asian culture, there is a belief that close network members (e.g., family or close friends) should anticipate needs of others before such support is explicitly sought, and people in need should not ask for help explicitly. Asian people in need tend to have concerns about negative consequences of help-seeking behaviors such as disruption of harmony more than they are concerned about a lack of support.

Consequently, Asian culture has been related to a lower utilization of social support. For example, Kim and McKenry (1998) compared African-Americas, Asian Americans, European Americans, and Hispanics regarding social support networks. They found that Asian Americans were less likely to use social support to cope with stress than were European Americans. Collectively, it seems likely that there may be cultural differences in how people seek and receive social support from their social networks even though people from all cultures can benefit by social support (Kim et al., 2008).

The cultural variation in the pattern of social relationships and support is tested to emerging adults. According to Guan and Fuligni (2015), emerging adults from European backgrounds turned to their parents increasingly more for help, advice, sympathy, and cheering up in the years after high school, while those from Asian and Latin American backgrounds show a stable pattern of received parental support. Notably, there was no difference among ethnic groups at 12th grade in terms of parent support, but European Americans had higher levels of parent support at four years after high school graduation (i.e., emerging adulthood) than did Asian Americans.

Mental health recovery. Recovery is a guiding vision for contemporary mental health systems (Anthony, 1993; Gomi, Starnino, & Canda, 2014; Torrey & Wyzik, 2000). Yet confusion

and debate continue when defining recovery (Davidson, O'Connell, Tondora, Lawless, & Evans, 2005; Pilgrim, 2008). The confusion surrounding the concept of recovery may be because many stakeholders have their own perspectives on recovery. They hold different viewpoints regarding the etiology of mental illness, preferred treatment approach, professional and consumer roles, and the indicators of recovery (Starnino, 2009). Among many perspectives, the modern scientific paradigm and the consumer-survivor movement are among the most influential, yet competing, standpoints (Davidson et al., 2005). In this section, those two standpoints will be reviewed.

The modern scientific paradigm, or simply the medical model, seeks the cause of mental illness from biological explanations (Taylor & Bentley, 2004). The medical model believes that brain dysfunctions are related to physiological problems, which means those problems can be treated if they are diagnosed and prescribed accurately by experts. For those in this position, recovery means alleviation of psychiatric symptoms and attainment of basic functioning such as independent living (Whitley & Drake, 2010). With the advances in antipsychotic medications and brain imaging techniques, the modern scientific paradigm has gained power throughout the past half-century (Starnino, 2009).

A different perspective on mental health recovery is endorsed by the consumer-survivor movement (Davidson et al., 2005). Despite the variation within this perspective, this group of people commonly questions the idea of mental illness as a disease itself, or at least the assumption that mental illness is a chronic condition (Kruger, 2000; Starnino, 2009). They focus on power inequality and stigma as a problem precluding people with psychiatric difficulties from achieving recovery. Therefore, recovery is understood as the status of being empowered, holding hope, pursing one’s goals, and experiencing fulfillment in life regardless of psychiatric symptoms (Anthony, 1993; Carpenter, 2002; Deegan, 1988, 1997).

Even though biological explanations are not completely ruled out, prominent definitions of recovery nowadays are more likely to reflect the perspective of the consumer-survivor movement (Whitley & Drake, 2010). For example, the Substance Abuse and Mental Health Services Administration (2016) defines recovery as "a journey of healing and transformation enabling a person with a mental health problem to live a meaningful life in a community of his or her choice while striving to achieve his or her full potential" (p.2). Deegan (1988) also described recovery as "a way of life, an attitude, and a way of approaching the day's challenges […] to reestablish a new and valued sense of integrity and purpose within and beyond the limits of the disability." (p.15)

Recovery as a multidimensional construct. Based on Wilber's integral theory, Starnino (2009) attempted to integrate various viewpoints of mental health recovery, including the modern consumer perspective, modern scientific paradigm, consumer-survivor movement, and community mental health professionals. He concluded that these viewpoints are interconnected so that no single domain or viewpoint can represent the wholeness of mental health recovery; mental health recovery should be viewed as a multidimensional construct (Starnino, 2009).

In the same vein, Whitley and Drake (2010) proposed a multidimensional model of recovery. They explained that recovery is a concept comprised of five dimensions including clinical, existential, functional, physical, and social domains. Clinical recovery means the alleviation and control of symptoms as highlighted in the medical model (Davidson & Roe, 2007). Existential recovery involves hope, responsibility, self-direction, and empowerment in line with SAMHSA's definition of recovery (SAMHSA, 2016). Functional recovery refers to being able to participate in everyday life and in society as a member of community. Examples include employment, maintaining independent housing, and education. Physical recovery

involves enjoying physical health and well-being. People with SMI often suffer from obesity, diabetes, and other diseases, partially due to the unhealthy life style pervasive in this population or the side effects of antipsychotic medications. Thus, enjoying healthy life style such as doing exercises is also important. The final domain is social. It includes establishing and maintaining relationships and engaging in rewarding social activities, community integration, and active citizenship.

Of particular interest is that Whitley and Drake (2010) emphasized the interconnectedness among five dimensions of recovery. They viewed that improvement in one dimension leads to improvement in another dimension, and some dimensions could be more critical than other dimensions for particular people. For example, employment (i.e., functional recovery) may bring community integration (i.e., social recovery), which potentially enhance hope (i.e., existential recovery). Further, these domains may work together to reduce symptoms (i.e., clinical recovery).

They also suggested potential measurable outcomes for five domains of recovery. For clinical recovery, hospitalization, adherence to treatment, and the severity of symptoms were suggested; for existential recovery, hope, emotional well-being, spiritual well-being, sense of self-efficacy and autonomy, and sense of empowerment were suggested; for functional recovery, obtaining and maintaining employment, beginning and completing educational course, and obtaining and maintaining independent housing were suggested; for physical recovery, caloric intake, level of exercise, weight, circumference, and substance use were suggested; for social recovery, social support, social capital, social activity, community integration, citizenship, and sense of belonging were suggested.

Emerging adults' conceptualization of mental health recovery. Emerging adults' conceptualization of mental health recovery has not yet been at the center of inquiry. Only a handful of qualitative studies explored the meaning of mental health recovery for emerging adults with SMI, particularly for those who are in the early stages of mental illness. Overall, the literature suggests that the conceptualization of mental health recovery among emerging adults with SMI is similar to that of those with SMI in other age groups. Similar to the recovery narratives described by mental health consumers ages 40 to 50, emerging adults with SMI viewed recovery as a multidimensional construct (Eisenstadt, Monteiro, Diniz, & Chaves, 2012; Lal, Ungar, Malla, Frankish, & Suto, 2014; Lam et al., 2010). For example, Eisenstadt et al. (2012) reported that emerging adults with SMI felt recovered when they experienced improvement of psychiatric symptoms (especially reduction of hallucinations and delusions), establishment of new social connections or improvement in the quality of existing social relationships, regaining autonomy and independence, restoration of self-reliance and trust in others, and/or meaning making toward psychosis experience.

Some emerging adults with SMI held a positive view of having mental illness. Specifically, while the majority of narratives were about frustrations resulting from experiencing mental illness, some emerging adults with SMI described having mental illness as an opportunity from which they can learn and grow (Eisenstadt et al., 2012). Also, most emerging adults with SMI had an optimistic view about their recovery such that they believed they would recover someday (Lam et al., 2010). In addition, some emerging adults with SMI tried to view their strengths more. Windell and Norman (2012) found that emerging adults who do not have substance abuse issues in addition to psychiatric symptoms said that they were proud of themselves for not engaging in substance abuse.

Yet, some emerging adults with SMI perceived the clinical domain of recovery more seriously than other domains. In Lam et al. (2010)'s qualitative study, a majority of participants described that they would never feel that they are fully recovered before they got back to normal life, defined as the status of before the onset. At the extreme, one participant mentioned that recovery is not achieved as long as a person is taking medications.

Social relationships as a critical factor in mental health recovery. Scholars and theorists emphasize that recovery is a deeply personal and individual journey (Anthony, 1993; Deegan, 1988; Starnino, Gomi, & Canda, 2014). Yet, this journey is also profoundly interconnected with the social context where an individual lives. According to Onken et al. (2007), recovery is a phenomenon involving individual, environment, and exchanges (i.e., interaction and transaction) between those two. Recovery is about change occurring not only at an individual level but also at a system level. Thus, true recovery can only occur through efforts in all four levels of systems: (a) person-centered elements of recovery (i.e., hope, sense of agency, self-determination, meaning and purpose, awareness, and potentiality), (b) re-authorizing elements of recovery (i.e., coping, healing, wellness, thriving), (c) exchange-centered elements of recovery (i.e., social functioning and social roles, power, and choice), and (d) community-centered elements of recovery (i.e., social connectedness/relationships, social circumstances/opportunities, integration, and realizing recovery). This holistic approach to recovery emphasizes the premise that recovery relies not only on the individuals' internal fulfillment but also on society's external resources supporting those fulfillments.

Some scholars contend that social factors play the main role in determining whether people make a recovery from mental illness (Tew, 2013). In particular, social relationships are critical to recovery of people with SMI as certain elements of recovery such as empowerment,

hope, and positive self-identity are closely related to social relationships (Tew et al., 2011). Specifically, receiving encouragement from family or friends and participating peer support or self-help groups increase feelings of control over life, thereby contributing to empowerment of people with SMI (Nelson, Lord, & Ochocka, 2001) and developing hope (Spaniol, Wewiorski, Gagne, & Anthony, 2002). In terms of self-identity, social relationships, especially relationships with peers who have had similar experiences, help a person with SMI form a positive self-identity as a person with problems but also with abilities as opposed to a passive self-identity (Schön, Denhov, & Topor, 2009).

Summary of theoretical literature

The theoretical literature was reviewed in order to understand the social relationships in emerging adulthood and the importance of social relationships in mental health recovery. The convoy model of social relationships provides a theoretical framework that views individuals' social relationships and their relative importance as they might change over the life course. A family is an important source of social relationships in all generations, but emerging adults tend to value friends more than family. The levels of family support can be low for emerging adults while social strains from family can be high for emerging adults as compared to older generations. In terms of relationships with friends, paradox appeared: emerging adults tend to have more friends than older generations and likely perceive that friends are important, but social strains from friends among emerging adults can also be the highest. Romantic relationships are important for emerging adults such that the importance of romantic partners peaks during emerging adulthood.

A review of literature on mental health recovery suggests that recovery should be understood as a multidimensional construct and that social factors are critical to promoting

recovery. Even though the medical perspective, which defines recovery as remission of symptoms and attainment of basic functioning, is still pervasive, recovery cannot be reduced to merely a clinical concept. Among many, Whitley and Drake (2010) proposed five dimensions of mental health recovery that include clinical, existential, functional, physical, and social. They also suggested measurable outcomes for each domain. For example, clinical recovery could be assessed by the severity of symptoms, existential recovery by hope, functional recovery by employment, physical recovery by healthy life style (e.g., doing exercise), and social recovery by social integration. Further, Whitley and Drake (2010) explained that recovery mechanisms can differ by particular people, suggesting that the recovery mechanisms between emerging and middle-aged adults with SMI could differ. Some qualitative studies exploring the concept of mental health recovery reported that emerging adults with SMI viewed mental health recovery as a multidimensional construct like people with SMI in other ages. However, emerging adults with SMI were unique in that they exhibited more positive and optimistic views toward experiencing mental illness and mental health recovery.

Critique of theoretical literature

The social convoy model provides a useful framework to understand the social relational changes that emerging adults experience by integrating the life course perspective into our understanding of social support development. However, it does not fully explain why such difference occurs. Kahn and Antonucci (1980) suggested that external circumstances such as changes in social roles or locations are the possible explanation of changes in the composition and hierarchy of social convoys across the life-course. However, the changes in external circumstances may be not sufficient to fully explain the social relational changes over the life-courses. There are many things changed during the life-course, including available economic and

emotional resources, cognitive ability, and perspective on the life. These factors should be taken into account in our understanding of social relational changes across the life course.

In addition, the social convoy model does not discriminate the relative importance of people within the innermost circle members. The convoy model holds that relationships with inner circle members such as relationships with spouses are stable throughout the life course, while relationships with people in the periphery of the convoy such as relationships with coworkers are less stable (Antonucci & Akiyama, 1987; Kahn & Antonucci, 1980). However, the relative importance and stability could differ even within the innermost circle members. As reviewed previously, parents are in most cases the example of the innermost circle members, but the relative importance can be reduced as people transit from childhood to emerging adulthood.

Next, the convoy model tends to fit explaining social relational changes of people in the general population, not of people who are experiencing extremely adverse life events such as the onset of mental illness. The impact of extremely traumatic non-normative life events such as the onset of mental illness likely differs from the impact of less severe events such as relocating the residence. Also, the same event can influence more severely if the person is suffering from preexisting life adversity. The social convoy model does not sufficiently explain this matter; therefore, it is questionable yet if the social convoy model is suitable to understand social relational changes of people with SMI.

A review of literature on mental health recovery also suggests several limitations worth noting. Although many scholars share the view that mental health recovery is a multidimensional construct, the relationships among the subdomains of recovery tend to be understudied. Improvement in one dimension may lead to the improvement in another dimension, and some dimension could be more critical than another dimension for particular people. For example,

Whitley and Drake (2010) hypothesized that functional recovery may bring social recovery, which potentially promotes existential and clinical recovery. However, empirical research on this has not been conducted.

Social relationships have been regarded as equally important across the life stages in the literature. From the perspective of the social convoy model, however, the relative importance of social relationships can change across the life course. The figure that was important at a certain stage might not be important any more or less important in a different stage. Related to mental health recovery, the impact of a certain social relationship on mental health recovery in one life stage may differ depending on the developmental stages of the particular people. As Davidson et al. (2005) pointed out, however, the recovery paradigm to date tends to be developed for middle-aged individuals who have a prolonged course of illness or for whom achieving clinical recovery is hardly expected. Examination of the mental health recovery paradigm for various life stages should be conducted for theory development. The next section summarizes the empirical literature regarding social relationships and mental health recovery.

Empirical literature

Researchers have investigated the role of social relationships in mental health recovery of people with SMI (Tew, 2011). Especially with the development of various recovery measurements, the influence of social relationships has been assessed quantitatively. The differential influence of social relationships by types (i.e., relationships with family, friends, and professionals), quantity and quality of social relationships, types of supportive behaviors, and relationship strains have been studied. However, it is rarely the case that such studies focused on emerging adults with SMI. For this reason, this section presents the empirical literature on social

relationships and mental health recovery of all ages first. Then, empirical studies that investigated emerging adults with SMI, in particular, are highlighted next.

Social relationships and recovery of all ages. Overall, researchers found a positive impact of social relationships on mental health recovery (see APPENDIX A for a summary). For example, Corrigan and Phelan (2004) investigated the relationships between social support and recovery using the Recovery Assessment Scale (RAS) among community mental health consumers with SMI in their middle years (Mean=41.3, SD=10.5). They analyzed the relationships between the size of support networks (i.e., overall support, family support, friend support, and professional support), network density (i.e., satisfaction, mutuality, obligation), and five individual domains of recovery (i.e., personal confidence and hope, willingness to others, goal and success orientation, reliance on others, and not dominated by symptoms). In general, the size of social networks was positively associated with domains of recovery except for the domain of *not dominated by symptoms*. Such domain was only related to the perception of network satisfaction.

Often, family was identified as the most significant source of relationships. Pernice-Duca and Onaga (2009) examined the relationships among (a) the size of social relationships (i.e., family support, friend support, professional support, and clubhouse support), (b) overall perceived support, (c) reciprocity, (d) contact, (e) satisfaction and (f) recovery using both cross-sectional and longitudinal data. Using a sample of clubhouse members with SMI in their middle years (Mean=45.1, SD=9.6), they found that friend support, clubhouse support, overall level of perceived support, reciprocity, and satisfaction were associated with recovery when they analyzed the cross-sectional data. However, when they analyzed the relationships between social

relationships at baseline and recovery one and a half years later, only family support, overall perceived support, and reciprocity were related to recovery.

Some studies investigated the role of family support in mental health recovery in-depth. Pernice-Duca (2010) explored the aspects of family support that contribute to mental health recovery the most among community mental health consumers with SMI in the middle years (Mean=43.0, SD=9.7). Using hierarchical regression analysis, results revealed that reciprocity (i.e., perceived level of support provided to each network member) was the strongest predictor of recovery. Similarly, Biegel et al. (2013) focused on the contribution of family to recovery using a cross-sectional survey with clubhouse members (Mean age=43.6, SD=11.6). Researchers asked participants various aspects of social relationships including (a) overall family support, (b) criticalness of family members, (c) satisfaction with the family relationships, (d) positive relationships quality assessed by support given from the most supportive person (not necessarily family), and (e) negative relationships quality assessed by undermining from the most supportive person (not necessarily family). Hierarchical multiple regression results revealed that overall family support is the most significant factor in recovery, in particular, to *personal confidence and hope* domain of recovery. In contrast, positive relationship quality was the most significant factor related to *willingness to ask for help* and *reliance on others* domains of recovery.

While the empirical literature reviewed thus far provides solid evidence for the beneficial role of social relationships in the recovery process, it should be mentioned that those findings were from samples of community mental health service users in their middle years. For example, Biegel et al. (2013) and Pernice-Duca and Onaga (2009) surveyed clubhouse members and Corrigan and Phelan (2004) and Chang, Heller, Pickett, and Chen (2013) recruited

participants at the community mental health centers. Consequently, as shown in APPENDIX A, the age of samples across studies ranged 18 to 77 with the mean ages in the 40s.

Social relationships and the recovery of "emerging adults" with SMI. A review of empirical literature on social relationships and mental health recovery of people with SMI of all ages established that social relationships contribute to recovery. However, as pointed out, the findings came from samples of community mental health consumers with the mean ages in the 40s. According to the social convey model, social relationships surrounding individuals change over the life course, and the relative importance of those relationships vary by the life stages. Therefore, the association between social relationships and mental health recovery may differ for emerging adults with SMI. However, the literature focusing on the role of social relationships in the recovery of emerging adults with SMI, in particular, is lacking. The following section reviews the existing empirical literature on social relationships and recovery particularly among emerging adults with SMI. The social relational characteristics of emerging adults with SMI are presented first. Then, the empirical literature regarding the role of social relationships in the mental health recovery of emerging adults with SMI is followed.

Social relational characteristics of "emerging adults" with SMI. The body of evidence clearly shows that emerging adults with SMI often suffer from a lack of social relationships. Emerging adults in their early stages of psychosis had a smaller network size compared to the same age counterpart without any mental illness (Erickson, Beiser, Iacono, Fleming, & Lin, 1989). The frequency of contact with social network members was also lower in this population than the general population as people with SMI usually lost contact with their old friends after being diagnosed (Hirschfeld, Smith, Trower, & Griffin, 2005; Reininghaus et al., 2008). The quality of social relationships was also low among emerging adults with SMI. Macdonald,

Hayes, and Baglioni (2000), for example, showed that emerging adults with SMI received the same amount of social support compared to their peers without SMI, but such support was less likely from friends and more likely from family or professionals. In the same vein, emerging adults with SMI were more likely to receive support from their network members rather than provide, suggesting an imbalance of reciprocity (Horan, Subotnik, Snyder, & Nuechterlein, 2006).

Although it is still not clear whether the onset of mental illness limits social relationships or the lack of social relationships contributes to mental illness (Gayer-Anderson & Morgan, 2013), many experts agreed that considerable changes in the social relationships are likely to occur relatively early in the course of mental illness (Addington, Young, & Addington, 2003; Macdonald, Sauer, Howie & Albiston, 2005). Consistent with this view, some qualitative studies described that emerging adults with SMI experience an increasing social isolation since the beginning of the psychotic episode (Mackrell & Lavender, 2004).

Social activities and social roles of emerging adults with SMI differ from older adults with SMI. Kaplan, Salzer, and Brusilovskiy (2012) found that “emerging adults with mental illness,” defined as mental health consumers age 18 to 30, were more likely to spend time with a friend while “mature adults with mental illness,” defined as mental health consumers age 31 or older, were more likely to participate in self-help groups. Also, emerging adults with mental illness were more likely to occupy student roles, whereas mature adults with mental illness were more likely to occupy parent roles.

The role of social relationships among “emerging adults” with SMI. The literature on the role of social relationships in mental health recovery particularly among emerging adults with SMI is critically lacking. No quantitative study exploring the role of social relationships in the

mental health recovery of “emerging adults” with SMI was identified. Some qualitative studies explored the role of social relationships in the mental health recovery of emerging adults with SMI.

Overall, qualitative studies reported the benefits of having supportive relationships to the mental health recovery of emerging adults with SMI. Stein (2012) interviewed five emerging adults with emotional or behavioral difficulties such as depression, bipolar, and anxiety disorder, ages 18 to 25, and presented that these young people appreciate informal assistance and support from family, friends, and a romantic partner. Encouragement, advice, and feeling of having someone to lean on helped emerging adults with SMI to achieve their vocational and educational goals (Stein, 2012). Indeed, social support was the most frequently noted facilitator of recovery (Windell & Norman, 2012). Family members helped with the recovery of their adult children with SMI by offering various forms of instrumental support (i.e., place to live, financial help) and emotional support (i.e., feeling of being loved). Friends also helped with the recovery by involving in “reality testing” and providing advice “without the coercive overtones” (Windell & Norman, 2012).

Doherty and MacGeorge (2013) identified 11 types of helpful behaviors by asking 30 emerging adults with bipolar disorder, “What are some of the best things that [support provider] has said or done to help you cope with your bipolar disorder?” (p.363). Helpful behaviors were categorized into three themes of emotional support, everyday support, and managing the illness support. Emotional support includes conversational support, reappraisal support, esteem or encouragement, and expression of love; everyday support includes tangible support and activity support; and illness-management support includes advice and information, treatment support, vigilance support, educational support, and maintenance support. Further, in the narratives of

emerging adults with bipolar disorder, conversational and tangible support, which belongs to emotional support, was the most frequently mentioned forms of support, and both family and friends were mentioned as the effective sources across multiple types of support (Doherty & MacGeorge, 2013).

While the family was the most frequently noted supportive relationship (Lester et al., 2011; Windell & Norman, 2012), friendships are also critical to achieving mental health recovery as friendship performs a unique function, especially in relation to self-identity. Leavey (2009) reported that some youth with SMI achieved recovery by creating a new self-identity. Friendships were critical in this process. Youth with SMI felt connected and being understood by interacting with peers, ultimately helping them create a new self-identity. However, not all friendships were beneficial to the recovery of youth with SMI. Leavey (2009) described that "participants' sense of self-esteem seemed less negatively affected if they did not pursue friends that had abandoned them." (Leavey, 2009, p.117).

There can also be unwelcome social support or interaction. For example, Henderson and Cock (2015) interviewed 10 emerging adults aged 19 to 29 in the early stages of psychosis. They summarized internal and external resources that helped the participants overcome the difficulties they face. Among external resources, support from others was valued by some participants, but others described that too frequent visits from helping professionals and too much control from their family members frustrated them by making them feel helplessness.

The complexity in the role of social relationships is also reflected in the study by Hirschfeld et al. (2005). Hirschfeld et al. (2005) interviewed six unmarried young men aged 19 to 29 in the early stages of psychosis to explore their subjective experience of psychosis. These young men expressed that they feared to pursue friendships because of the previous negative

experiences that they had with friends such as being misunderstood. In terms of romantic relationships, in particular, participants wished to have one, but they felt shy and feared having such a relationship. In fact, one participant shared an irony of having a romantic relationship. He said that his girlfriend gives him a feeling of security and safety but takes up too much of his time, resulting in him "feeling distant from his parents and unable to communicate with them." That is, having a romantic partner for this particular young man paradoxically resulted in increased isolation and alienation from his other sources of support. Such ambivalent feeling toward romantic relationships was reported in the study by Leavey (2009) as well. Youth with SMI described that they are too emotionally vulnerable to engage with someone romantically, and other goals such as finishing their education felt more important than pursuing a romantic relationship (Leavey, 2009).

The role of social relationships in mental health recovery has been examined quantitatively with the sample of people with First Episode Psychosis (FEP). Findings from these studies can be informative as the age ranges of the sample in the FEP research coincides with emerging adulthood (see APPENDIX B). Overall, findings from the FEP research indicate that the perceived social support is beneficial to mental health recovery. Higher levels of social support, a larger network size, or good family relations were positively associated with mental health recovery, as measured by RAS, functional level, self-esteem, and employment (Mattsson, Topor, Cullberg, & Forsell, 2008; Norman et al., 2005; Norman, Windell, Lynch, & Manchanda, 2013; Norman et al., 2012). However, not all studies found a statistical significance of such associations. For example, Tempier, Balbuena, Lepnurm, and Craig (2013) found a statistically significant association between perceived emotional support and remission, while Erickson, Beiser, and Iacono (1998) failed to find a statistically significant association between perceived

support and global functioning. Similarly, social network, measured by the number of contacts with family and friends, was associated with global functioning in Erickson et al. (1998) but was not statistically significant in Albert et al. (2011).

The influence of social relationships differed by the types of relationship or by the diagnosis. Several studies compared non-kin versus kin support (Erickson et al., 1998; Erickson, Beiser, Iacono, Fleming, & Lin, 1989; Norman et al., 2005) and found consistent beneficial effects of non-kin support and inconsistent effects of kin support. Erickson et al. (1989) explored the interaction effects of diagnosis and social support and found that the impact of social support was only relevant to samples with schizophrenia. The number of kin in the network was negatively associated with social and occupational functioning for samples with schizophrenia but not for samples with affective psychosis. Further, the amount of contact with non-kin members was positively associated with social and occupational functioning for samples with schizophrenia but not for samples with affective psychosis.

In contrast to the beneficial effects of social relationships, some FEP studies suggested that social relationships could be negative. Tempier et al. (2013) found that samples who were in contact with family at a moderate level (i.e., 10-35 hours per week) were more likely to relapse than those who were in contact with family at a low level (i.e., less than 10 hours per week). They explained that frequent contact is not always beneficial for individuals with SMI since the effect could differ depending on whether it conveys warmth or blame. Similarly, some researchers proposed that a moderate level of social contact is optimal because low and high levels of social contact could be stressful to people with FEP. Specifically, Dozier, Harris, and Bergman (1987) showed a quadratic relationship between the social network size and

hospitalization such that young patients with moderate levels of network density had fewer days in the hospital than those with low or high density.

Factors associated with mental health recovery in the FEP research. Interestingly, some factors influenced the association between social relationships and mental health recovery in the FEP literature. These include gender, culture, income level, and the duration of mental illness. Firstly, gender variation in the influence of social relationships on recovery was suggested in the FEP literature. In the study by Thorup et al., (2007), men usually had poorer social networks than women and this gender variation became larger as they go along the course of illness. In the two years of follow-up study, the size of social networks at entry was not different between male and female participants, but males were likely to have fewer social network members at two years later (Thorup et al., 2006). Interestingly, when the social networks were analyzed separately for family networks and friend networks, this gender variation was shown only in relation to family relationships, not to friendships.

The association between social relationships and mental health recovery could differ by culture (Kalla, Wahlstyöm, Aaltonen, Lehtinen, & González de Chávez, 2011). Kalla and colleagues compared 12-month recovery outcomes of young people with FEP from Spain and Finland, focusing on the differential significance of social relationships. They hypothesized that family continues to remain as an important source of social support for young people with FEP in Spain, while friends would be an important source of social support for those in Finland. This hypothesis was based on cultural differences between Spain and Finland such as Spanish young people tend to remain in the parents' home until they marry while Finnish young people leave home at a younger age. In fact, they found that a different set of factors were associated with recovery outcomes for Spanish and Finnish young people with FEP. Specifically, parental

criticism was negatively associated with recovery among Spanish young people with FEP, while the number of contacts with friends, social recreational activities, and stability in couple relations were positively associated with recovery among Finnish young people with FEP.

The FEP literature also suggests that income level could be important to understand the association between social relationships and mental health recovery. Socioeconomic status, mostly income level, has been linked to better health and mental health outcomes (Case & Deaton, 2015). The higher income level reduces risk factors such as stress (Marwaha, & Johnson, 2004) or enables people to have more opportunities to interact with others by providing means (Davidson, Bellamy, Guy, & Miller, 2012). For people with FEP specifically, Mattsson and colleagues (2008) investigated the impact of financial strains on the level of functioning among people with FEP and found that financial strains were associated with lower levels of functioning.

However, the influence of improved income on the mental health recovery of people with FEP is mixed. The major source of income for people with SMI often supplemental income from the government, such as SSI and SSDI. However, recent studies showed that a receipt of government supplemental income does not necessarily help with the mental health recovery of people with FEP. For example, Rosenheck et al., (2017) investigated the impact of receiving government supplemental income for two years. They found that a receipt of supplemental income was related to increased total income, but reduced sense of purpose and motivation, and poor time utilization. There was no significant association of improved income with psychiatric symptoms and depression, autonomy, recovery, stigma, subjective well-being, or quality of life (Rosenheck et al., 2017). Similarly, Estroff and colleagues (1997) reported that people at an early stage of psychiatric disorders who receive disability benefits had more severe symptoms, more

social isolation, and were more dependent on others compared to their counterpart who do not receive benefits.

The age of onset and duration of untreated illness are arguably the most important topic in the FEP research. Through years of research, it is known that the later ages of onset and a shorter duration of untreated illness are related to positive prognosis, especially in relation to functional recovery (Birchwood, et al., 1997; Emsley, Rabinowitz, & Medori, 2007; Malla et al., 2005). Also, people with SMI typically experience changes over the course of mental illness (Shepherd et al., 2010); in the early years of illness, people with SMI tend to experience upheaval related to social and family relationships as well as related to dealing with symptoms; in the later years of illness, people with SMI tend to adapt to symptoms and try to construct the meaningful life, although not all achieve this.

Recovery measures used in the FEP research. The operationalization of recovery across the FEP studies tends to emphasize clinical and medical views of recovery (see APPENDIX C). Remission (Tempier et al., 2013), relapse (Alvarez-Jimenez et al., 2011), hospitalization (Dozier et al., 1987; Norman et al., 2005), and the severity of positive and negative symptoms (Kalla et al., 2011; Norman et al., 2005; Norman et al., 2013) were used frequently. Even when recovery was defined by multiple features, clinical aspects tended to be dominant. For example, Albert et al. (2011) considered one to be recovered if that person (a) presented stable remission of both negative and positive symptoms, (b) had not been hospitalized or lived in a supported housing for at least two years, (c) had a 60 or greater score on Global Assessment Functioning (GAF), and (d) had a job or student status. That is, three of four conditions qualifying recovery were clinical (i.e., symptoms, hospitalization, and functioning).

A standardized measurement such as the Recovery Assessment Scales (RAS), the Modified Engulfment Scale (MES), and the Grip on Life were used in some studies (see APPENDIX C). However, these studies still tend to focus on partial aspects of mental health recovery, compared to the five domains of mental health recovery suggested by Whitley and Drake (2010). For example, the MES assessed the extent to which an individual's self-concept and social roles are dominated by his or her mental illness (Norman et al., 2013) and the Grip on Life assessed the psychosocial adjustment (Kalla et al., 2011). The domain of physical recovery of people with SMI is largely unknown.

Summary of empirical literature

A review of empirical literature on the association between social relationships and mental health recovery shows that having supportive relationships contributes to mental health recovery of people with SMI of all ages. Often, family was identified as the most significant source of relationships. Overall family support is the most significant factor in recovery, but there is limited evidence on the impact of negative family interactions. Also, when recovery is assessed by multiple dimensions (i.e., as measured by the validated scales such as RAS), the mechanism linking social relationships and each dimension of recovery varied. For example, the size of social networks was positively associated with (a) *personal confidence and hope*, (b) *willingness to ask for help*, (c) *goal and success orientation*, and (d) *reliance on others* but not with *not dominated by symptoms.* Such domain was only related to the perception of network satisfaction.

Emerging adults with SMI, similar to middle-aged and older adults with SMI, likely suffer from a lack of social relationships as compared to their peers without SMI. Due to mental health difficulties, they had to reconstruct the existing relationships. However, previous studies

tend to focus on the differences in social relationships between people with SMI and without SMI, rather than the differences within those with SMI. Importantly, there is evidence showing that social activities and social roles of emerging adults with SMI differ from older adults with SMI. As compared to older adults with SMI, emerging adults with SMI were more likely to spend time with friends. Emerging adults with SMI were more likely to occupy student roles, whereas older adults with SMI were more likely to occupy parent roles.

Consistent with empirical studies conducted using a sample of all ages, a few qualitative studies of emerging adults with SMI noted that the supportive relationships contribute to mental health recovery. While family was the most frequently noted supportive relationship, friendships were also critical to mental health recovery as friendships perform a unique function, especially in relation to self-identity. Emerging adults with SMI desire to have a romantic partner; but they tend to give up forming romantic relationships for other life goals such as finishing their education. One qualitative study described a paradox of having a romantic partner, having romantic relationships helps emerging adults with SMI feel security and safety but also takes up too much time, resulting in increased isolation and alienation from other sources of support.

The findings from the FEP research are generally consistent with the quantitative studies conducted with people with SMI of all ages. The overall positive influence of having supportive relationships was shown in the FEP literature. The differential influence of social relationships by the type, and the potential negative impact of some relationships were also shown. Gender, culture, income level, and the duration of mental illness appear to interact with the association between social relationships and mental health recovery. Interestingly, the FEP research suggests the moderating effect of diagnosis. The association between social relationships and recovery

was shown only for the sample with schizophrenia, but not for the sample with affective disorders.

Gaps in the empirical literature

Although some studies have explored the association between social relationships and the mental health recovery of emerging adults with SMI, there are gaps in the current empirical literature. Overall, the empirical literature on the role of social relationships in mental health recovery has evolved without considering the developmental stages of people with SMI. The previous mental health literature has rarely focused on the developmental heterogeneity within mental health consumers. As reviewed in the empirical literature section, samples across studies, in general, were adults aged 18 to 77 with the mean ages in the 40s (see APPENDIX A). When emerging adults were the study population, their mental health conditions were more likely to be vulnerable conditions other than SMI such as eating disorders, Attention Deficit Hyperactivity Disorder, or substance use disorders (e.g., Goodman, Peterson-Badali, & Henderson, 2011; Striegel-Moore, Seeley, & Lewinsohn, 2003; Young, 2000).

The relative importance of various social relationships to the mental health recovery of emerging adults with SMI is not well known. The previous empirical research tends to have explored the role of social relationships on mental health recovery using a sample of mental health consumers in the middle ages and suggests that family is the most significant source of relationships. However, the importance of family may be lower among emerging adults with SMI compared to middle-aged adults with SMI. Emerging adults, in general, tend to value friendships more than family relationships. The FEP research demonstrated that non-family relationships were more predictive of recovery. Also, some qualitative studies interviewed

emerging adults with SMI reported that friendships were critical to the recovery of emerging adults with SMI by helping them accept themselves and recreate their self-identity.

In addition, romantic relationships in regard to the recovery of emerging adults with SMI are understudied. Formation and maintenance of romantic relationships are often central to the lives of emerging adults. Romantic partners have a unique status as they function not only as family members but also as friends. However, it is not known if romantic partners are promoting or hindering mental health recovery because negative effects of having romantic relationships were also reported in some qualitative studies.

Studies directly comparing emerging adults with SMI to older counterparts are also limited. The body of knowledge on social relationships of emerging adults with SMI to date is established by comparing emerging adults with and without SMI. Otherwise, some studies explored the difficulties of emerging adults with SMI without any comparison group. The unique needs of emerging adults with SMI would stand out by comparing with middle-aged adults with SMI. The comparison is expected to be useful to develop interventions targeting emerging adults with SMI who have been treated the same as other mental health consumers in older ages. To date, only one empirical research investigated the differences between emerging and older adults with SMI and showed that social activities and social roles differed between these two groups (Kaplan et al., 2012). Whitley and Drake (2010) emphasize that mechanism achieving recovery may differ by particular people. Therefore, identifying unique needs of emerging adults with SMI by comparing with the traditional mental health research population (i.e., middle-aged adults with SMI) is needed to guide future interventions.

The previous empirical studies tend to focus on the positive aspects of social relationships (e.g., social support). However, since the relationships typically have both positive

(e.g., help and intimacy) and negative (e.g., conflicts) aspects (Cutrona, 1990; Weiss, 1974), both sides of relationships should be assessed. Wong, Matejkowski, and Lee (2011) maintain that negative transactions can be stronger in influencing psychological adjustment of people with SMI than positive or supportive transactions. Thus, the negative interactions with various social relationships and their influence on mental health recovery among emerging adults with SMI should be further explored.

Next, mental health recovery is not well conceptualized as a multidimensional concept in the previous empirical literature on emerging adults with SMI. The empirical literature on the recovery of people with SMI in all ages nowadays tend to use validated recovery measurements, having multiple aspects of recovery (e.g., RAS consisted of five domains). However, in the quantitative research of emerging adults with SMI (i.e., the FEP research), mental health recovery is commonly reduced to a clinical concept such as psychiatric symptoms, hospitalization, or global functioning. Also, the physical domain of recovery (i.e., having healthy lifestyle) has been understudied in the empirical research.

Inconsistent results in the previous quantitative research call for a replication study. Firstly, it is still not clear whether social relationships are beneficial or detrimental to emerging adults with SMI. The majority of empirical studies demonstrated the positive impact of social relationships, but still, other studies showed that social relationships could burden this population. Further, in the case of focusing on the positive role of social relationship in recovery, not all studies successfully established the association. For example, Tempier et al. (2013) found a statistically significant association between perceived emotional support and remission, while Erickson et al. (1998) failed to find a statistically significant association between the perceived support and global functioning. Similarly, the social network size, measured as the number of

contacts with family and friends, was positively associated with global functioning in the study by Erickson et al. (1998) but was not statistically significant in the study by Albert et al. (2011). Further study is needed to replicate findings from those studies.

Finally, a majority of the empirical studies on emerging adults with SMI, particularly quantitative studies, are based on the research conducted for emerging adults in the early stages of psychosis. Relatively less is known about emerging adults with diagnoses other than psychotic disorders. However, affective disorders are more prevalent psychiatric conditions than non-affective disorders. Also, the mechanism linking social relationships to recovery could differ for people having affective disorders and those having non-affective disorders. Erickson et al. (1989) explored the interaction effects of diagnosis and social support and found that the impact of social support was only significant to the samples with schizophrenia. Therefore, studies for emerging adults with affective disorders are needed to expand the knowledge base.

Rationale for the current study

The social convoy model provides a useful framework to understand the social relational changes that emerging adults experience by integrating the life course perspectives into our understanding of social support development. However, the social convoy model tends to fit explaining social relational changes of people in the general population. The social convoy model has rarely tested for people with SMI.

The empirical literature on the role of social relationships in mental health recovery has evolved without considering the developmental stages of people with SMI. The body of knowledge on social relationships of emerging adults with SMI to date is established by comparing emerging adults with and without SMI. Otherwise, some studies explored the difficulties of emerging adults with SMI without any comparison group. The distinctive needs of

emerging adults with SMI could stand out by comparing with middle-aged adults with SMI. The comparison is expected to be useful to develop interventions targeting emerging adults with SMI who have been treated the same as other mental health consumers in older ages. Whitley and Drake (2010) emphasize that mechanism achieving recovery may differ by particular people. Therefore, identifying distinctive needs of emerging adults with SMI by comparing with the traditional mental health research population (i.e., middle-aged adults with SMI) is needed to guide future interventions.

The current study attempted to address some of the limitations and gaps in the literature. The purpose of this exploratory study is (a) to examine the social relational characteristics of emerging adults with SMI in comparison with middle-aged adults with SMI and (b) to examine the differential role of social relationships in the mental health recovery of emerging adults with SMI in comparison with middle-aged adults with SMI. In order to understand the relative importance among various types of social relationships of emerging adults with SMI, family, friends, and romantic partners were explored separately. Informed by the multidimensional model of mental health recovery, the influence of family, friends, and romantic partners was explored in relation to clinical, existential, functional, physical, and social recovery, respectively.

Chapter 3: Methodology

Research questions and hypotheses

The theoretical and empirical literature reviewed in the previous chapters suggest that social relational characteristics and the influence of those relationships on the mental health recovery of emerging adults with SMI may differ from those of adults with SMI in other ages. To test this, this exploratory study compared emerging adults with SMI with middle-aged adults with SMI. Middle-aged adults with SMI were selected for comparison because they have been the most commonly studied population in the previous empirical literature.

The social convoy model suggests that social relationships surrounding people change over the life course and the relative importance of social relationships differs by life stages. The empirical literature exploring the composition and the hierarchy of social relationships among emerging, middle-aged, and older adults in the general population showed that emerging adults tend to value the relationships with friends and romantic partners more than the relationships with their original family and receive more support from friends and romantic partners than family. Consistent with these observations, this study hypothesized that emerging adults with SMI as compared with middle-aged adults with SMI have less positive support from family, more negative interactions with family, more positive support from friends, more positive support from romantic partners, and less negative interactions with romantic partners.

In addition, it was hypothesized that the influence of family, friends, and romantic partners on the mental health recovery of emerging adults with SMI (i.e., adults aged 18 to 29 years) differs from middle-aged adults with SMI (i.e., adults aged 40 to 65 years). Following the multidimensional definition of recovery by Whitley and Drake (2010), mental health recovery in this study was conceptualized to include five domains of recovery: clinical, existential,

functional, physical, and social. Each domain of recovery was measured according to the measurable outcomes proposed by Whitley and Drake (2010). They proposed hospitalization, adherence to treatment, and the severity of symptoms for clinical recovery; hope, emotional well-being, spiritual well-being, self-efficacy, autonomy, and empowerment for existential recovery; employment, education, and maintaining housing for functional recovery; healthy lifestyle, weight, and substance abuse for physical recovery; social support, social capital, and community integration for social recovery. Due to the availability of variables in the dataset, only some of the proposed variables were used to measure five domains of mental health recovery. Clinical recovery was measured by the severity of symptoms; existential recovery was measured by the level of hope; functional recovery was measured by employment status; physical recovery was measured by the level of exercise; social recovery was measured by neighborhood participation. Sex, race, income level, and the years since the onset of mental illness were adjusted for based on the empirical literature suggesting that social relationships and their influences on mental health recovery may differ by gender, culture, socio-economic status, and the duration of mental illness. The research questions and the corresponding research hypotheses of the current study are presented below.

1. **Do social relational characteristics of emerging adults with SMI differ from middle-aged adults with SMI, after controlling for sex, race, income level, and the years since the onset?**
    a. **Hypothesis 1-1**: Emerging adults with SMI will have less positive support from family than middle-aged adults with SMI, after controlling for sex, race, income level, and the years since the onset.

b. **Hypothesis 1-2**: Emerging adults with SMI will have more negative interactions with family than middle-aged adults with SMI, after controlling for sex, race, income level, and the years since the onset.

c. **Hypothesis 1-3**: Emerging adults with SMI will have more positive support from friends than middle-aged adults with SMI, after controlling for sex, race, income level, and the years since the onset.

d. **Hypothesis 1-4**: Emerging adults with SMI will have more positive support from romantic partners than middle-aged adults with SMI, after controlling for sex, race, income level, and the years since the onset.

e. **Hypothesis 1-5**: Emerging adults with SMI will have less negative interactions with romantic partners than middle-aged adults with SMI, after controlling for sex, race, income level, and the years since the onset.

2. **Do the influences of family, friends, and romantic partners on mental health recovery differ between emerging and middle-aged adults with SMI, after controlling for sex, race, income level, and the years since the onset?**

Clinical Recovery

a. **Hypothesis 2-1-1**: Among emerging adults with SMI, positive support from family will not be associated with the severity of symptoms after controlling for sex, race, income level, and the years since the onset while it will be associated among middle-aged adults with SMI.

b. **Hypothesis 2-1-2**: Among emerging adults with SMI, negative interactions with family will not be associated with the severity of symptoms after controlling for sex,

race, income level, and the years since the onset while it will be associated among middle-aged adults with SMI.

c. **Hypothesis 2-1-3**: Among emerging adults with SMI, positive support from friends will be associated with the severity of symptoms after controlling for sex, race, income level, and the years since the onset while it will not be associated among middle-aged adults with SMI.

d. **Hypothesis 2-1-4**: Among emerging adults with SMI, positive support from romantic partners will be associated with the severity of symptoms after controlling for sex, race, income level, and the years since the onset while it will not be associated among middle-aged adults with SMI.

e. **Hypothesis 2-1-5**: Among emerging adults with SMI, negative interactions with romantic partners will be associated with the severity of symptoms after controlling for sex, race, income level, and the years since the onset while it will not be associated among middle-aged adults with SMI.

Existential Recovery

a. **Hypothesis 2-2-1**: Among emerging adults with SMI, positive support from family will not be associated with the level of hope after controlling for sex, race, income level, and the years since the onset while it will be associated among middle-aged adults with SMI.

b. **Hypothesis 2-2-2**: Among emerging adults with SMI, negative interactions with family will not be associated with the level of hope after controlling for sex, race, income level, and the years since the onset while it will be associated among middle-aged adults with SMI.

c. **Hypothesis 2-2-3**: Among emerging adults with SMI, positive support from friends will be associated with the level of hope after controlling for sex, race, income level, and the years since the onset while it will not be associated among middle-aged adults with SMI.

d. **Hypothesis 2-2-4**: Among emerging adults with SMI, positive support from romantic partners will be associated with the level of hope after controlling for sex, race, income level, and the years since the onset while it will not be associated among middle-aged adults with SMI.

e. **Hypothesis 2-2-5**: Among emerging adults with SMI, negative interactions with romantic partners will be associated with the level of hope after controlling for sex, race, income level, and the years since the onset while it will not be associated among middle-aged adults with SMI.

Functional Recovery

a. **Hypothesis 2-3-1**: Among emerging adults with SMI, positive support from family will not be associated with employment status after controlling for sex, race, income level, and the years since the onset while it will be associated among middle-aged adults with SMI.

b. **Hypothesis 2-3-2**: Among emerging adults with SMI, negative interactions with family will not be associated with employment status after controlling for sex, race, income level, and the years since the onset while it will be associated among middle-aged adults with SMI.

c. **Hypothesis 2-3-3**: Among emerging adults with SMI, positive support from friends will be associated with employment status after controlling for sex, race, income

level, and the years since the onset while it will not be associated with middle-aged adults with SMI.

d. **Hypothesis 2-3-4**: Among emerging adults with SMI, positive support from romantic partners will be associated with employment status after controlling for sex, race, income level, and the years since the onset while it will not be associated among middle-aged adults with SMI.

e. **Hypothesis 2-3-5**: Among emerging adults with SMI, negative interactions with romantic partners will be associated with employment status after controlling for sex, race, income level, and the years since the onset while it will not be associated among middle-aged adults with SMI.

Physical Recovery

a. **Hypothesis 2-4-1**: Among emerging adults with SMI, positive support from family will not be associated with the level of exercise after controlling for sex, race, income level, and the years since the onset while it will be associated among middle-aged adults with SMI.

b. **Hypothesis 2-4-2**: Among emerging adults with SMI, negative interactions with family will not be associated with the level of exercise after controlling for sex, race, income level, and the years since the onset while it will be associated among middle-aged adults with SMI.

c. **Hypothesis 2-4-3**: Among emerging adults with SMI, positive support from friends will be associated with the level of exercise after controlling for sex, race, income level, and the years since the onset while it will not be associated among middle-aged adults with SMI.

d. **Hypothesis 2-4-4**: Among emerging adults with SMI, positive support from romantic partners will be associated with the level of exercise after controlling for sex, race, income level, and the years since the onset while it will not be associated among middle-aged adults with SMI.

e. **Hypothesis 2-4-5**: Among emerging adults with SMI, negative interactions with romantic partners will be associated with the level of exercise after controlling for sex, race, income level, and the years since the onset while it will not be associated among middle-aged adults with SMI.

Social Recovery

a. **Hypothesis 2-5-1**: Among emerging adults with SMI, positive support from family will not be associated with neighborhood participation after controlling for sex, race, income level, and the years since the onset while it will be associated among middle-aged adults with SMI.

b. **Hypothesis 2-5-2**: Among emerging adults with SMI, negative interactions with family will not be associated with neighborhood participation after controlling for sex, race, income level, and the years since the onset while it will be associated among middle-aged adults with SMI.

c. **Hypothesis 2-5-3**: Among emerging adults with SMI, positive support from friends will be associated with neighborhood participation after controlling for sex, race, income level, and the years since the onset while it will not be associated among middle-aged adults with SMI.

d. **Hypothesis 2-5-4**: Among emerging adults with SMI, positive support from romantic partners will be associated with neighborhood participation after

controlling for sex, race, income level, and the years since the onset while it will not be associated among middle-aged adults with SMI.

e. **Hypothesis 2-5-5**: Among emerging adults with SMI, negative interactions with romantic partners will be associated with neighborhood participation after controlling for sex, race, income level, and the years since the onset while it will not be associated among middle-aged adults with SMI.

To test hypotheses, this study utilized a quantitative, cross-sectional design. To better understand the association between social relationships with family, friends, and romantic partners and mental health recovery in variously defined domains simultaneously, Structural Equation Modeling was used (see Figure 1 for the conceptual model). Social relationship constructs of *Positive Support from Family*, *Negative Interactions with Family*, *Positive Support from Friends*, *Positive Support from Romantic Partners*, and *Negative Interactions with Romantic Partners* were modeled as latent variables given the abstract nature of variables. For mental health recovery, clinical recovery, existential recovery, functional recovery, physical recovery, and social recovery were modeled as manifest variables. Details are explained later in the analysis section.

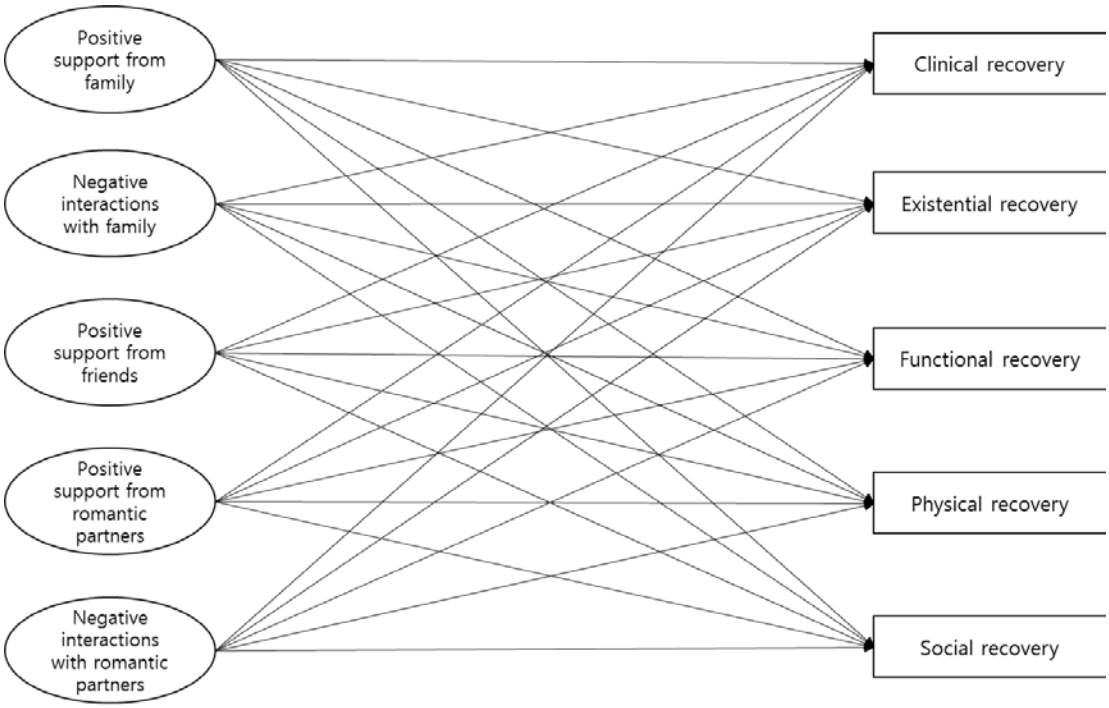

Figure 1. Conceptual Model

Secondary data analysis: the National Survey of American Life

This dissertation study used the National Survey of American Life (NSAL). NSAL is a nationally representative dataset, with the main purposes of exploring racial and ethnic differences in mental disorders, psychological distress, informal and formal services uses along with a various risk and resiliency factors (Jackson et al., 2004b). Using a multistage probability sampling technique, a national sample of 4,000 African-Americans, 1,800 non-Hispanic Whites, and 1,000 Blacks of Caribbean descent (i.e., Afro-Caribbeans) were approached. The final sample includes 3,570 African Americans, 1,438 Afro-Caribbeans, 891 non-Hispanic Whites, and 183 Hispanic individuals (the overall response rate was 89.4%). Hispanic individuals were categorized later if they were indicated as White or Black individuals of Hispanic descent (Heeringa et al., 2004).

Between February 2001 and March 2003, teams of trained interviewers conducted face-to-face interviews or telephone interview (about 14% of total interviews), using a computer-assisted instrument. Details of the NSAL sample and the data collection procedures are available elsewhere (Heeringa, Torres, Sweetman, & Baser, 2006; Jackson, Neighbors, Nesse, Trierweiler, & Torres, 2004a; Jackson et al., 2004b; Pennell et al., 2004).

Advantages and disadvantages of using NSAL. NSAL was chosen for two reasons: (a) NSAL provides diagnostic information for the sample and (b) it contains various social relational variables in the dataset. Usually, a national dataset of a community sample (e.g., the National Longitudinal Study of Adolescent to Adult Health) does not assess mental health diagnoses of participants; rather it uses alternative ways to screen the psychological symptoms of participants such as Center for Epidemiologic Studies Depression Scale (CES-D). Even though the levels of depression as assessed by CES-D are highly correlated with the presence of mental illness, not all people indicated to have serious levels of depression are people with a diagnosis of SMI. In contrast, NSAL administered the World Mental Health Composite International Diagnostic Interview (WMH-CIDI) to identify the Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV) disorders of participants, allowing the current study sample emerging and middle-aged adults with a diagnosis of SMI.

Moreover, NSAL has rich information regarding social relationships. Other psychiatric epidemiological surveys, including the National Comorbidity Survey-Replication (NCS-R) and the National Latino and Asian American Study (NLAAS), do have DSM-IV diagnosis variables; but those two datasets provide limited information on social relationships of participants. For example, romantic relationships were not assessed in the two aforementioned datasets. The items assessing family and friend relationships are limited. Specifically, in NCR-S and NLAAS,

friendship quality was assessed by only one question asking the frequency of contact with friends. In the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), social relationships were assessed by multiple yes-no questions asking the quality of social networks overall, not differentiating the types of social relationships in their assessment of social relationship quality.

However, NSAL has disadvantages as well. First, NSAL is a cross-sectional study, so findings from NSAL cannot reveal whether social relationships influence mental health recovery or vice versa. Second, NSAL includes only Black and White populations as its original purpose was to explore racial/ethnic differences within the Black population (i.e., differences between African Americans and Afro-Caribbeans) as compared with the White population. Therefore, the Black population is overrepresented and other racial/ethnic groups such as Asian American population are not included. Third, DSM-IV diagnoses included in NSAL are limited to non-psychotic diagnoses because WMH-CIDI does not have the ability to detect psychotic diagnoses such as schizophrenia. In this study, SMI includes “major depression, schizophrenia, and bipolar disorder, and other mental disorders that cause serious impairment” (SAMHSA, 2016, para 8) following the definition of SMI by SAMHSA. NSAL does not allow the current study include individuals with schizophrenia. Fourth, not all sources of social relationships are included in NSAL. For people with SMI, relationships other than family, friends, or romantic partners are also important. Examples include professionals who can be influential to the recovery of people with SMI. In terms of friend relationships, NSAL assesses only positive aspects of friend support. Finally, NSAL was collected in 2001 to 2003, so findings from this study may depict social relationships of emerging adults with SMI about 15 years ago.

Despite the disadvantages described above, NSAL is still useful to explore social relationships and their influences on mental health recovery among emerging adults with SMI. Given the limited quantitative research identifying the distinctiveness of emerging adults with SMI, a study using a national dataset can guide the future studies by taking the first step in this area of inquiry. Even though the data were collected about 15 years ago, the theory of emerging adulthood was developed around 2000. Therefore, the distinctiveness of emerging adults with SMI is likely to be found in the current study using NSAL. Future studies can be built on the findings from the current study.

Study participants

In this secondary data analysis, only respondents indicated to have SMI were included. The specific diagnoses used to select participants include bipolar I, and II, major depressive disorder, and post-traumatic stress disorder (PTSD) (n=1,040 adults in all ages, 17.1% of the total NSAL sample). SAMHSA (2016) listed major depressive disorder, schizophrenia, and bipolar disorder as examples of SMI. PTSD was added to the diagnostic criteria of screening SMI in the current study because PTSD is highly prevalent among individuals with SMI and some people develop PTSD in response to a psychotic episode (Lommen & Restifo, 2009). For example, 16% to 39% of people with bipolar disorder were estimated to have lifetime PTSD (Merikangas et al., 2007). Moreover, symptoms of PTSD overlap to a high degree with other psychiatric diagnoses, particularly major depressive disorders (Brady, Killeen, Brewerton, & Lucerini, 2000).

Among respondents indicated to have a diagnosis of SMI, respondents who are in emerging adulthood were the main population of interest. Following Arnett’s recent definition of

emerging adults (Arnett et al., 2014), respondents aged 18 to 29 were grouped into eme*rging adult* group (n=280).

Middle-aged adults with SMI (n=443), ages 40 to 65, were selected as a comparison group. Middle-aged adults with SMI were selected for comparison because they have been the most commonly studied population in the previous empirical literature (See APPENDIX A). The current body of knowledge on the association between social relationships and mental health recovery has been established based on the findings from middle-aged adults with SMI. Thus, the distinctiveness of emerging adults with SMI is expected to be best emerged by comparing with middle-aged adults with SMI. Also, middle-aged adulthood, approximately ages between 40 and 65, developmentally differs from emerging adulthood in terms of social roles as people in this age group usually perform parents' roles (Arnett, 2007). This age group coincides with middle-aged adulthood in the traditional developmental theories such as Erikson (1968) or Levinson (1986). According to Erikson's theory (1968), for example, middle adulthood is not anymore the time for career and intimate relationship development, which are often the tasks of emerging adulthood; rather, the primary task of middle adulthood is contributing to society and raising the next generation (Robbins, Chatterjee, & Canda, 2012). For this reason, respondents aged 40 to 64 were grouped into *middle-aged adult* group (n=443).

However, the current study was not able to use all 723 emerging and middle-aged adults with SMI due to the absence of romantic relationship variables for some participants. NSAL data were collected using two surveys: the main face-to-face survey and the follow-up mail survey, which is called as the National Survey of American Life, Self-Administered Questionnaire (NSAL-SAQ). The purpose of NSAL-SAQ is to reduce the respondent burden from the main survey, running approximately for two and a half hours. At the end of the main survey,

respondents were asked if they are willing to participate in a mail back survey. Only respondents agreed to participate received the follow-up mail survey. The overall response rate was 56.5% (n=3,483); with the response rate of 59.9% for African-Americans (n=2,137), 42.9% for Caribbean Blacks (n=695), and 68.0% for non-Latino Whites (n=606). Questions about romantic relationships are only included in NSAL-SAQ. So, about 63% of the selected sample did not have information on romantic relationships. Among the selected sample of 723 emerging and middle-aged adults with SMI, 149 emerging and 296 middle-aged adults with SMI participated in a follow-up mail back survey. The final sample, therefore, includes 149 emerging and 296 middle-aged adults with SMI (Figure 2).

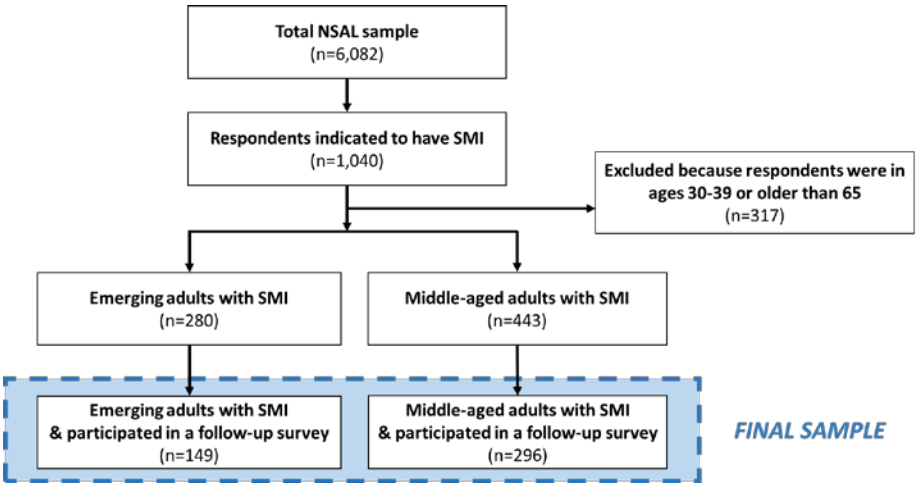

Figure 2. Sample Selection

Measures

Social relationships. NSAL has variables assessing multiple aspects of social relationships with regard to various types of relationship sources. The types of relationship sources included in NSAL are family, friends, and romantic partners. For each type of relationship, both positive and negative aspects of relationships were assessed except for friends. For the relationships with friends, only positive support from friends was assessed. In the current

study, therefore, the measured domains of social relationships include: (a) positive support from family, (b) negative interactions with family, (c) positive support from friends, (d) positive support from romantic partners, and (e) negative interactions with romantic partners. These variables were included as latent variables in the analysis.

Overall, items used Likert scales with 4 to 7 response options ranging from 1 (very often/nearly every day) to 4 or 7 (never/not at all) to assess the quality of relationships. In this study, items were recoded, in reverse, with 1 (never/not at all) to 4 or 7 (very often/nearly every day); higher scores indicate higher levels of positive support or higher levels of negative interactions. Survey questions and coding mechanisms are presented in Table 1.

Positive support from family. Eight items were asked to assess positive support from family. Items include: (a) received help from family, (b) frequency of contact, (c) number of family members who would help respondents, (d) closeness in feeling, and (e) received emotional support. Family members for these questions refer to children, parents, grandparents, aunts, uncles, and in-laws, excluding spouse or partners. The reliability of the items measuring positive support from family was good with α=.831.

Negative interactions with family: Three items assessing negative interactions with family were asked to respondents. Like positive support from family, family members for these questions include children, parents, grandparents, aunts, uncles, and in-laws but exclude spouse or romantic partners. The reliability of the items measuring negative interactions with family was also good with α=.730.

Positive support from friends. Five items asking (a) frequency of contact with friends, (b) received support, (c) closeness in feeling with friends, (d) number of family-like friends, and (e) received help from the family-like friends were used to measure positive support from

friends. The reliability of the items measuring positive support from friends was acceptable with α=.678.

Positive support from romantic partners. Six items were used to measure positive support from romantic partners. Items include emotional and instrumental support received from spouse or romantic partners. These questions were asked only when respondents answered that they are currently married or have a partner. Participants who reported no romantic relationships at the time of survey were considered to have no positive support from romantic partners. In such case, items were coded 0 to indicate no positive support from romantic partners. The reliability of the items measuring positive support from romantic partners was very good with α=.991.

Negative interactions with romantic partners**:** Five items were used to measure negative interactions with romantic partners. Like the items for positive support from romantic partners, these items were asked only when respondents answered that they were currently married or have a romantic partner at the time of the survey. For participants who reported no romantic relationships, items were coded 0 to indicate no negative interactions with romantic partners. The reliability of the items measuring negative interactions with romantic partners was also very good with α=.970.

Table 1. Survey Questions and Coding Mechanism for Social Relationship Indicators

Domains	**Survey questions**	**Coding**
Positive support from family	FS1: How often do people in your family help you out?	4: Very often 3: Fairly often 2: Not too often 1: Never 0: Never Needed help or no family
	FS2: How often do you see, write, or talk on the telephone with family or relatives who do not live with you?	7: Nearly every day 6: At least once a week 5: A few times a month 4: At least once a month

		3: A few times a year 2: Hardly ever 1: Never
	FS3: How many people in your family would help you out if you needed help?	Number (0-97)
	FS4: How close do you feel towards your family members?	4: Very close 3: Fairly close 2: Not too close 1: Not close at all
	FS5: Would you say your family members are very close in their feelings toward each other?	4: Very close 3: Fairly close 2: Not too close 1: Not close at all
	FS6: How often do your family members make you feel loved and cared for?	4: Very often 3: Fairly often 2: Not too often 1: Never
	FS7: How often do your family members listen to you talk about your private problems and concerns?	4: Very often 3: Fairly often 2: Not too often 1: Never
	FS8: How often do your family members express interest and concern in your well-being?	4: Very often 3: Fairly often 2: Not too often 1: Never
Negative interactions with family	FN1: How often do your family members make too many demands on you?	4: Very often 3: Fairly often 2: Not too often 1: Never
	FN2: How often do your family members criticize you and the things you do?	4: Very often 3: Fairly often 2: Not too often 1: Never
	FN3: How often do your family members try to take advantage of you?	4: Very often 3: Fairly often 2: Not too often 1: Never
Positive support from friends	FR1: How often do you see, write, or talk on the telephone with your friends?	7: Nearly every day 6: At least once a week 5: A few times a month 4: At least once a month 3: A few times a year 2: Hardly ever 1: Never

		0: Has no friend
	FR2: How often do your friends help you out?	4: Very often 3: Fairly often 2: Not too often 1: Never 0: Never needed help
	FR3: How close do you feel towards your friends?	4: Very close 3: Fairly close 2: Not too close 1: Not close at all
	FR4: How many people are close to your family who are not really blood or marriage related but who are treated just like a relative?	Number (0-100)
	FR5: How often does that person (i.e., family like friends) help you out?	4: Very often 3: Fairly often 2: Not too often 1: Never 0: Never needed help or no friend
Positive support from romantic partners	RS1: How much does your spouse/partner really care about you?	4: A great deal 3: Some 2: A little 1: Not at all 0: No romantic partner
	RS2: How much does he/she appreciate you?	4: A great deal 3: Some 2: A little 1: Not at all 0: No romantic partner
	RS3: How much can you rely on him/her?	4: A great deal 3: Some 2: A little 1: Not at all 0: No romantic partner
	RS4: How much would he/she help you out financially if you needed it?	4: A great deal 3: Some 2: A little 1: Not at all 0: No romantic partner
	RS5: How much would he/she take care of you if you were sick?	4: A great deal 3: Some 2: A little 1: Not at all 0: No romantic partner

	RS6: How often does your spouse/partner make you feel loved and cared for?	4: Very often 3: Fairly often 2: Not too often 1: Never 0: No romantic partner
Negative interactions with romantic partners	RN1: How often does he/she make too many demands on you?	4: Very often 3: Fairly often 2: Not too often 1: Never 0: No romantic partner
	RN2: How often does he/she argue with you?	4: Very often 3: Fairly often 2: Not too often 1: Never 0: No romantic partner
	RN3: How often does he/she criticize you?	4: Very often 3: Fairly often 2: Not too often 1: Never 0: No romantic partner
	RN4: How often does he/she let you down when you are counting on him/her?	4: Very often 3: Fairly often 2: Not too often 1: Never 0: No romantic partner
	RN5: How often does he/she get on your nerves?	4: Very often 3: Fairly often 2: Not too often 1: Never 0: No romantic partner

Mental health recovery. As reviewed in the theoretical framework section, recovery should be understood as a multidimensional construct, having multiple aspects of clinical, existential, functional, physical, and social domains (Whitley & Drake, 2010). Thus, the current study examined the influence of social relationships on the recovery of emerging adults with SMI, using five outcomes. Basically, recovery was measured in accordance with the suggested

measurable outcomes by Whitley and Drake (2010). Mental health recovery variables were included in this study as manifest variables to maintain consistency among outcome variables.

Clinical recovery. The first outcome is related to the clinical domain of recovery. Whitley and Drake (2010) explained that clinical recovery involves reduction and control of symptoms and suggested reduced hospitalization, adherence to treatment, and reduced symptom as possible indicators of clinical recovery. In this study, the clinical domain of mental health recovery was defined in terms of the severity of symptoms and measured by K6. K6 is a six-item scale designed to measure nonspecific psychological distress in the past 30 days, including symptoms of depression and anxiety (Kessler et al., 2002). Specifically, respondents were asked how much of the time they felt (a) so sad nothing could cheer respondents up, (b) nervous, (c) restless or fidgety, (d) hopeless, (e) everything was an effort, and (f) worthless. Each item was measured on a 5-point Likert scale, ranging from 0 (none of the time) to 4 (all of the time), with a summed scale yielding scores ranging 0 to 24. Prior research demonstrated that scores above 13 correspond to severe psychological distress (Kessler et al., 2003). The validity of K6 was supported by a number of studies (e.g., Kessler et al., 2002; 2003) and the reliability of K6 in this study was .863. For the current study, the summed score with a possible range of 0 to 24 was used; but it was recoded in reverse to indicate higher score better clinical recovery (i.e., less severe symptoms).

Existential recovery. Whitley and Drake (2010) also suggested hope, responsibility, self-direction, and empowerment as the existential domain of recovery. Among those suggestions, the level of hope was used as an existential recovery variable in this study. In NASL, respondents were asked to indicate the extent to which they agree or disagree with two statements. These statements are (a) “I feel that it is impossible to reach the goals I would like to strive for” and (b)

"the future seems hopeless to me and I can't believe that things are changing for the better." A four-point Likert scale was used, ranging from 1 (strongly agree) to 4 (strongly disagree). Items were summed to create a score representing the level of hope, with high scores being indicative of higher levels of hope. The validity of this two-item measure of hopelessness was supported previously (Fraser et al., 2014). The reliability of these two items in this study was .647.

Functional recovery. Whitley and Drake (2010) defined functional recovery as participating in everyday life and specified that employment, education, and maintaining independent housing as possible measurable outcomes of functional recovery. In this study, only employment status was used as an indicator of functional recovery due to the absence of other variables. In NSAL, employment status was measured as: 1=employed, 2=unemployed, 3=not in labor force. For this study, employment status was dichotomized as 1=currently working (employed) and 0=not currently working (combining unemployed and not in labor force).

Physical recovery. Whitley and Drake (2010) suggested diet, exercise, smoking and substance abuse as indicators of physical recovery. In the current study, physical recovery was assessed by three questions about the level of exercise. Respondents were asked to answer their level of exercise on a 4-point Likert scale for the questions (a) "how often do you work in the garden or the yard?" (b) "How often do you engage in active sports or exercise?" and (c) "How often do you take walks?" Responses were recoded as 3=often, 2=sometimes, 1=rarely, and 0=never, then summed to create the total score representing the level of exercise. No validity study has conducted for this measure yet, and the internal consistency of these two items tends to be low in this study with $\alpha = .432$. Despite the low reliability and no information on the validity, the current form of measurement for physical recovery was retained because these three

questions are widely used in nationally representative surveys such as the Americans' Changing Lives to measure the level of exercise.

Social recovery. Social recovery is related to interpersonal relationships and community participation (Whitley & Drake, 2010). In this study, social recovery was defined as neighborhood participation and measured by two items. First, respondents were asked "how often do you get together with any of your neighbors, that is, either visiting at each other's home or going places together?" This item was originally coded on a 6-point-Likert scale, 5=nearly every day (4 or more times a week), 4=at least once a week (1 to 3 times a week), 3=a few times a month (2 to 3 times a month), 2=at least once a month, 1=a few times a year, and 0=never. Second, respondents were also asked if there is any group in the neighborhood such as block clubs, community associations, social clubs, helping groups and so forth, and if there is any, they were asked if they are involving with any of these groups (1=yes, 0=no).

Because these two items had different mechanisms for coding, one dichotomous variable was created based on the two aforementioned items in order to measure social recovery. Specifically, if respondents got together with neighbors at least a few times a year or were involving with any groups in the neighborhood, it was coded 1, indicating neighborhood participation. If respondents never got together with neighbors and were not involving with any groups in the neighborhood, it was coded 0, indicating no neighborhood participation.

Control variables. Sex, race, income level, and the years since the onset of SMI were included in the current study as control variables. For sex, a dichotomized variable of 0=male, 1=female was used. The racial categories for NSAL include African-American, Afro-Caribbean, and non-Hispanic White. In this study African-American and Afro-Caribbean were combined to create a dichotomized variable of 0=Black, 1=White. For income level, this study used the

income-to-need ratio variable available from the dataset to measure the economic status of the sample. The income-to-need ratio was calculated by dividing the total household income by the 2001 U.S. Census Bureau poverty threshold. The scores ranged from 0 to 17 with higher scores indicating higher household income (Alegria et al., 2008). The income-to-ratio is an indicator widely used by researchers to compute the household's levels of poverty. This ratio indicates how far below or above people are relative to the poverty threshold (McLoyd, Jocson, & Williams, 2016). Lastly, the years since the onset of SMI were obtained by asking respondents the age when they experienced their first psychiatric symptoms. In order to enhance the accuracy of responses, probe questions (e.g., "Was it before you first started school?", "Was it before you became a teenager?") were followed (Kessler et al., 2002). Such procedures were undertaken for all diagnoses endorsed by participants including major depressive disorders, bipolar disorder, and PTSD. When multiple diagnoses were endorsed, the earliest age was used. The years since the onset was then calculated by subtracting the age of onset from the age at the time of the survey.

Data analysis

For the data analyses, Structural Equation Modeling (SEM) was used. SEM is more flexible than traditional analytical methods such as regression model by accommodating multiple dependent variables, and it can account for measurement errors (Bollen & Lennox, 1991; Bollen, 2002). Overall, Structured Means Model (SMM) was administered to examine the social relational characteristics of emerging adults with SMI in comparison with middle-aged adults with SMI (Research Question 1). Multiple group SEM was administered to explore the distinctiveness in the association of social relationships and mental health recovery of emerging adults with SMI in comparison with middle-aged adults with SMI (Research Question 2).

Sample characteristics and descriptive statistics were analyzed using Stata 14 (StataCorp. 2015). The following sections describe detailed data analyses corresponding to each research question.

1. **Do social relational characteristics of emerging adults with SMI differ from middle-aged adults with SMI, after controlling for sex, race, income level, and the years since the onset?**

For research question 1, exploring the difference in the social relational characteristics between emerging and middle-aged adults with SMI, SMM was administered. SMM is a technique used for comparing latent variable means. Statisticians have recommended that researchers should use SEM-based techniques (e.g., SMM) to evaluate between-group differences in the latent variable means if latent variables are of interest (e.g., Aiken, Stein, & Bentler, 1994; Cole, Maxwell, Arvey, & Salas, 1993; Hancock, 1997). SMM has advantages compared to traditional approaches (i.e., Multivariate Analysis of Variable) for comparing the latent variable means because SMM (a) can account for unreliability of measurement, (b) allows for coherent conclusion to be reached at the construct level, and (c) is easy to include covariate in the analysis of mean (Thompson & Green, 2006). In the current study, social relationships with family, friends, and romantic partners were specified as latent variables, thereby SMM is an appropriate option.

Overall, social relationships of emerging and middle-aged adults with SMI were specified as a five-factor model of (a) positive support from family, (b) negative interactions with family, (c) positive support from friends, (d) positive support from romantic partners, and (e) negative interactions with romantic partners (Figure 3). Then, a series of analyses were

conducted to evaluate the construct comparability and the differences in the latent variables means between emerging and middle-aged adults with SMI.

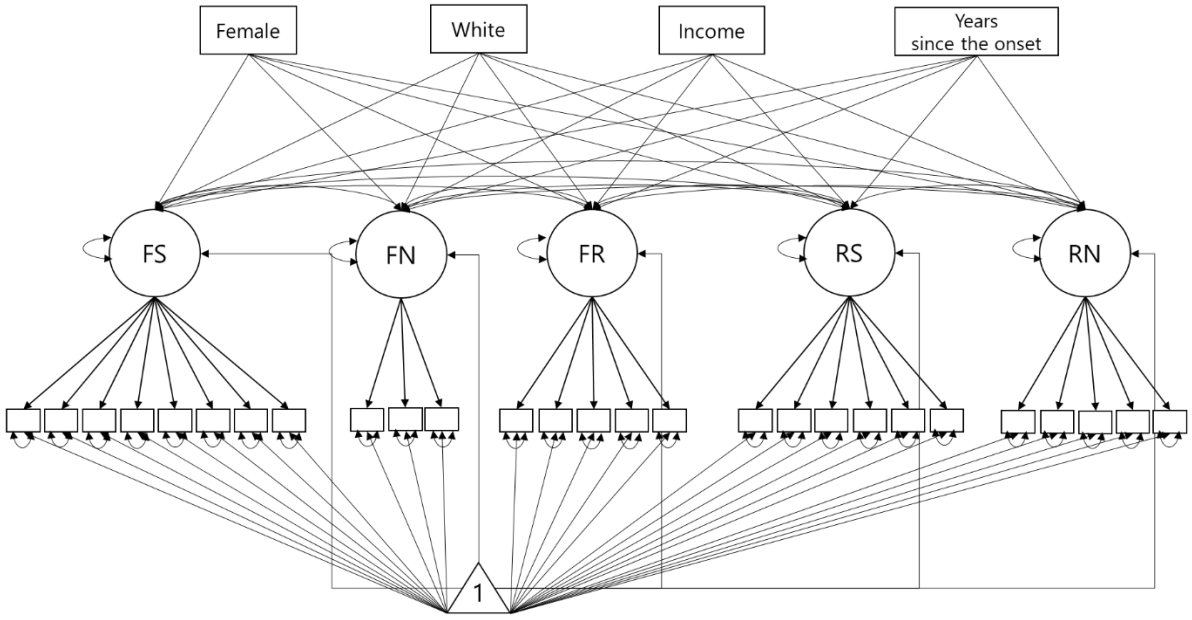

Figure 3. Structured Mean Model

Note. FS=Positive support from family; FN=Negative interactions with family; FR=Positive support from friends; RS=Positive support from romantic partners; RN=Negative interactions with romantic partners.

SMM model begins with a confirmatory factor analysis (CFA) for a single group, evaluates the construct comparability between groups, and then assesses the latent variable means between groups (Thompson & Green, 2006). In this study, a series of CFA was conducted with the combined sample of emerging and middle-aged adults with SMI to examine the measurement structure of social relationships. Then, the construct comparability of social relationships between emerging and middle-aged adults with SMI was tested by conducting

invariance testing. Finally, the differences in the social relational characteristics between emerging and middle-aged adults with SMI were examined by comparing the mean of latent social relationship constructs.

In SMM, the construct comparability should reach the level of strong invariance. Meredith (1993) describes four levels of measurement invariance: configural, weak, strong, and strict invariance. Configural invariance is established by retaining the same pattern of fixed and freed parameters for each group; weak invariance is established by constraining corresponding factor loadings for each construct equal across each group; strong invariance is established by equating the corresponding intercepts across each group (Brown, 2015; Little, 2013). By doing so, strong invariance requires not only the forms of the model (i.e., configural invariance) to be equivalent between groups, but also the paths between factors and indicators (i.e., weak invariance) and the intercepts of indicators (i.e., strong invariance) to be equivalent between groups.

After strong invariance between emerging and middle-aged adults with SMI was established, the latent factor means were compared by constraining the factor intercepts for middle-aged adults with SMI to zero while the factor intercepts for emerging adults with SMI were freely estimated. By doing this, freely estimated factor intercepts in the emerging adults group indicate the differences in the mean of social relationships between emerging and middle-aged adults with SMI.

Throughout the analyses, Weighted Least Squares Means and Variance Adjusted (WLSMV) estimation was used with Mplus 8.0. (Muthén & Muthén, 1998-2017) because of the categorical nature of social relationship variables. Model fit was evaluated using Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation

(RMSEA) model fit indices. As a general guide, CFI greater than .95, TLI greater than .95, and RMSEA smaller than .06 (Hu & Bentler, 1999) are preferred. The chi-square statistic was reported but not used to evaluate the model fit as a primary standard because chi-square statistic is sensitive to sample size (Bentler & Bonnet, 1980; Jöreskog & Sörbom, 1993). In seeking strong invariance, thresholds were equated between emerging and middle-aged adults with SMI, instead of intercepts, due to the categorical nature of social relationships variables. The DIFFTEST option in Mplus 8.0 was used to evaluate the model fits.

Given the previous literature suggesting that the level of social relationships could differ by gender, culture, socioeconomic status, and the years since the onset, those variables were included as control variables in the analyses of factor means. By doing this, the differences in factor means become the differences in *Positive Support from Family*, *Negative Interactions with Family*, *Positive Support from Friends*, *Positive Support from Romantic Partners*, and *Negative Interactions with Romantic Partners* between emerging and middle-aged adults with SMI, after controlling for sex, race, income level, and the years since the onset.

It should be mentioned that social relationship constructs possibly are emergent latent variables. Emergent latent system, or formative system, refers to the model specification in which effects flow from the indicators to a latent variable, not from a latent variable to indicators (Thompson & Green, 2006). In other words, formative system is the situation that typical SEM assumptions on the association between indicators and latent constructs are no longer applicable (Kline, 2013). An example of formative system is socioeconomic status (SES) (Bollen & Lennox, 1991). When income, education, and occupation are used to represent SES, the typical SEM specification assumes that SES causes income, education, and occupation. However, SES may be the outcome of income, education, and occupation, not vice versa.

Determination of whether a construct is formative system or reflective system (i.e., typical SEM solution) can be made conceptually or statistically. Conceptually, social relationships can be either system. For example, it is conceptually plausible that the level of positive support from friends influences the frequency of contact with friends, the amount of received support, closeness in feeling with friends, the number of family-like friends, and received help from the family-like friends. However, it is also conceptually plausible that the frequency of contact with friends, the amount of received support, closeness in feeling with friends, the number of family-like friends, and received help from the family-like friends altogether influence the perceived levels of positive support from friends. Statistically, the distinction between reflective systems and formative systems can be made by exploring intercorrelations among indicators (Petter, Straub, & Rai, 2007). Under reflective systems, indicators tend to be internally consistent, exhibiting positive and moderately high intercorrelations (i.e., unidimensional construct) while under formative systems, indicators tend to be internally inconsistent (i.e., multidimensional construct) (Hancock & Mueller, 2001; Kline, 2013). In the current study, social relationship constructs were specified as a reflective system given that the intercorrelations among indicators were high, and social relationships have been considered as reflective systems in the previous studies (e.g., Ashida & Heaney, 2008).

2. **Do the influences of family, friends, and romantic partners on mental health recovery differ between emerging and middle-aged adults with SMI, after controlling for sex, race, income level, and the years since the onset?**

For research question 2, exploring the differences in the association of social relationships and mental health recovery between emerging and middle-aged adults with SMI, multiple group SEM was used. Multiple group SEM determines whether there are statistically significant group differences in the structural path coefficients (i.e., the association of social relationships and mental health recovery) between emerging and middle-aged adults with SMI (Wang & Wang, 2012). To be specific, SEM model linking social relationships to various mental health recovery domains was first estimated separately for emerging adults with SMI and for middle-aged adults with SMI (i.e., unconstrained model). Second, this unconstrained model was compared with the model which constrains all structural path coefficients to be equal between emerging and middle-aged adults with SMI in terms of model fit. If the model fit is statistically significantly different, as indicated by chi-square difference test, it means the imposed constraints are not recommended. If the model fit is not statistically significantly different, it means the imposed constraints are recommended, suggesting no meaningful difference in the structural path coefficients between groups. In the event that statistically significant difference in model fit is suggested, the researcher explores the source of meaningful difference by releasing one coefficient at a time (Wang & Wang, 2012).

Like the analyses for research question 1, WLSMV estimation was used with Mplus 8.0. (Muthén & Muthén, 1998-2017). All possible model fit indices including chi-square statistics, CFI, TLI, and RMSEA were reported and used. The model fit tests were conducted using DIFFTEST option due to the categorical nature of variables.

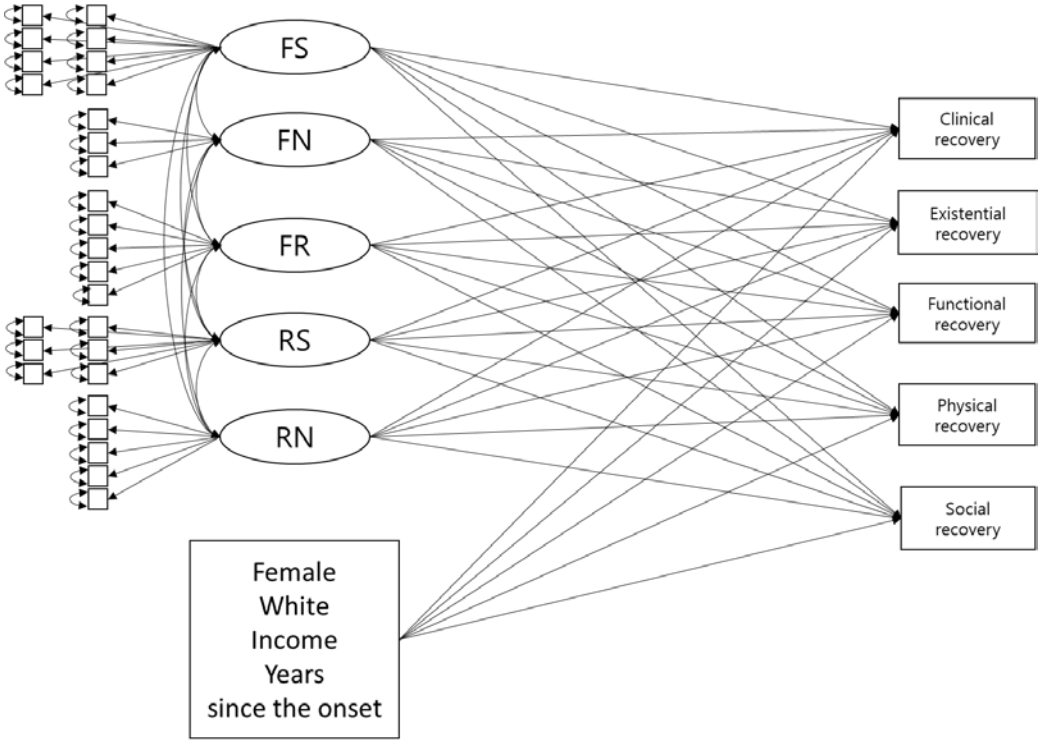

Figure 4. Multiple group SEM Model

Note. FS=Positive support from family; FN=Negative interactions with family; FR=Positive support from friends; RS=Positive support from romantic partners; RN=Negative interactions with romantic partner

Throughout the analyses conducted in the current study, the pairwise deletion was used to handle missing data. In general, advanced missing data handling techniques such as multiple imputation (MI) and full-information maximum likelihood (FIML) are preferred. However, in this study, FIML was not possible by using WLSMV estimation. This study tested the efficiency of MI by replicating the analyses of the current study using the imputed datasets (m=10, 50, and 70). The analyses using the imputed data showed the similar results to the one using the original data (i.e., not imputed data). Given that there are debates over the number of imputation required for MI (Graham, Olchowski, & Gilreath, 2007) and the guideline saying that Mplus WLSMV

estimation yields reliable results (Asparouhov, & Muthén), the results from the original data with the pairwise deletion were reported here. Schafer (1999) also advised that a risk of pairwise deletion is considered "inconsequential" when the missing rate is 5% or less. As shown in Table 2, the rates of missing data across variables were very low except for a clinical recovery variable.

Table 2. The Pattern of Missing Variables Included in the Model (n=445)

Domains	Variables	Total n	Valid n	Missing n	% of missing
Social relationships	FS1	445	445	0	0.00
	FS2	445	443	2	0.45
	FS3	445	443	2	0.45
	FS4	445	443	2	0.45
	FS5	445	440	5	1.12
	FS6	445	441	4	0.90
	FS7	445	443	2	0.45
	FS8	445	443	2	0.45
	FN1	445	443	2	0.45
	FN2	445	441	4	0.90
	FN3	445	443	2	0.45
	FR1	445	445	0	0.00
	FR2	445	430	15	3.37
	FR3	445	430	15	3.37
	FR4	445	438	7	1.57
	FR5	445	444	1	0.22
	RS1	445	441	4	0.90
	RS2	445	440	5	1.12
	RS3	445	436	9	2.02
	RS4	445	440	5	1.12
	RS5	445	442	3	0.67
	RS6	445	441	4	0.90
	RN1	445	443	2	0.45
	RN2	445	439	6	1.35
	RN3	445	436	9	2.02
	RN4	445	439	6	1.35
	RN5	445	440	5	1.12
Mental health recovery	Clinical recovery	445	365	80	17.98
	Existential recovery	445	441	4	0.90
	Functional recovery	445	445	0	0.00

Domains	Variables	Total n	Valid n	Missing n	% of missing
	Physical recovery	445	445	0	0.00
	Social recovery	445	444	1	0.22
Control variables	Sex	445	445	0	0.00
	Race	445	445	0	0.00
	Income level	445	445	0	0.00
	The years since the onset	445	440	5	1.12

It should be mentioned that multiple hypotheses were tested in this study and this may raise a concern about type I error. While type I error is still an important issue in the context of SEM, Bonferroni adjustments to control type I error were not made in the current study. The ultimate purpose of the current study is to explore a potential difference between emerging and middle-aged adults with SMI in terms of the social relational characteristics and their influences on mental health recovery. As the first quantitative study in this area of inquiry, testing multiple possibilities may be more important than controlling type I error. In addition, the procedures to adjust type I error have been proposed in the context of SEM (Hancock, Lawrence, & Nevitt, 2000), but the consensus was not made yet because those procedures tend to be overly conservative (McCoach, Black, & O'Connell, 2007).

Power analyses. Power analyses were conducted to test if the sample size (n=445, including 149 emerging adults with SMI and 296 middle-aged adults with SMI) is enough to administer the model. In the early years of SEM, "large sample", requiring the minimum sample size of five to ten per parameter (i.e., the N:q rule), used to be considered as a rule of thumb (Bentler & Chou, 1987). However, the sample size required for the analysis varies depending on multiple factors including the complexity of the model, the distribution of variables, the amount of missing data, the reliability of variables, and the strengths of the association among variables (Muthén & Muthén, 2002). In fact, Nevitt and Hancock (2004) demonstrated that under some

circumstances (e.g., extreme non-normality), convergence rate, type I error rate, and accuracy of estimated values are problematic even when the N:q rule is met. In this regard, Muthén and Muthén (2002) recommended that power should be determined empirically for researcher's model of interest. In this study, the adequacy of sample size was tested using power analysis techniques, rather than using sample size heuristic (e.g., the N:q rule) (Kline, 2015).

In SEM, researchers should consider two contexts for power analysis: a test of model fit and a test of significance of parameters within a model (Hancock & French, 2013). Firstly, power analyses of model fit were conducted using an online utility for RMSEA-based sample size planning available at http://www.quantpsy.org/rmsea/rmsea.htm (Preacher & Coffman, 2006) and R Studio (R Core Team, 2013).

For research question 1, exploring social relational characteristics using SMM, values for power analysis were set a null RMSEA at .08, α=.05, degrees of freedom (*df*)=407, and alternative RMSEA=.02. The values for null and alternative RMSEA of .08 and .02 correspond to acceptable fit (Little, 2013). The *df* was calculated by taking the number of elements in the covariance matrix being analyzed minus the number of estimated parameters in the model. The number of elements in the covariance matrix being analyzed was calculated by [the number of measured variable × (the number of measured variable + 1)] /2. The number of estimated parameters in the model was calculated by counting the number of estimated parameters. Specifically, the *df* for this model is 407. This value was calculated by subtracting 89 from 496, where 496 = 31 × 32 / 2 and 89 = 27 factor loadings + 27 error variances + 10 factor correlations + 5 path coefficients from sex to factors + 5 path coefficients from race to factors + 5 path coefficients from income level to factors + 5 path coefficients from years since the onset to

factors. According to the result from R Studio, the probability of obtaining acceptable model fit based on RMSEA was 100% with the sample size of 149.

For research question 2, exploring differences in the association between social relationships and mental health recovery using multiple group SEM model, values were set a null RMSEA specified at .08, α=.05, degrees of freedom (*df*)=557, and alternative RMSEA=.02. The *df* for this analysis was calculated by subtracting the number of parameters estimated from the number of elements in the covariance matrix being analyzed. Specifically, *df* for this analysis was 557 = 666 – 109, where 666 = 36 × 37 /2 and 109 = 45 path coefficients + 10 factor correlations + 27 factor loadings + 27 error variances. The probability of obtaining acceptable model fit based on RMSEA was 100% with the sample size of 149.

Secondly, Monte Carlo simulations were conducted using Mplus 8.0 (Muthén & Muthén, 1998-2017) to test the adequacy of the sample size to detect the significance of specified model parameters. Monte Carlo is a methodological strategy to investigate a performance of statistical estimators under various conditions. Monte Carlo approach for significance test of parameters is more flexible than analytical approach in that this approach can account for nonnormal data, different estimation procedures, missing data, and non-continuous variables. Serlin (2000) describes that Monte Carlo approach "provides the information needed to help researcher select the appropriate analytical procedures under design conditions in which the underlying assumptions of the procedures are not met" (p.231).

Basically, power analysis using a Monte Carlo simulation is to empirically observe the percentage of parameter estimates that is statistically significantly different from zero (Hancock & French, 2013). Once researcher provides values for population parameters, Mplus calculates the average parameter estimates, standardized deviations of estimates, average standard errors

(SE), and mean-square error (MSE) averaged across replication, 95% confidence intervals of each parameter, and the percentages of parameter estimates that are statistically significantly different from zero. The percentage of parameter estimates that is statistically significantly different from zero is power. The replication of 10,000 times were used in the study.

Several Monte Carlo simulations were conducted particularly for the model testing research question 2. Initial simulations were started using the value suggested by Muthén and Muthén (2002), under the sample size of 100, 200, and 300. After several times of simulation, it was suggested that factor loadings, residual, factor correlations, and residuals of mental health recovery outcomes do not strongly affect the power. Therefore, simulations of various regression path coefficients were conducted with fixed values for factor loadings, residuals, factor correlations. These values were factor loadings of .50, residuals of .36, factor correlations of .25, and residuals of .35. Those values can be considered conservative in that they are the lowest limit of factor loadings and correspond to small effect size. The sample size for Monte Carlo simulation was set as 149 because it is the number of sample in the group with smaller sample size (i.e., sample size for emerging adults with SMI).

Table 3 presents some of Monte Carlo simulation results. As explained above, Monte Carlo study presents the percentage of parameter estimates that is statistically significantly different from zero out of 10,000 times of replication for all parameters included in the model. In the output, each parameter in the model has its own percentage. Table 3 shows the lowest percent of significance and the highest percent of significance among parameters estimated in the model. For example, when the population parameter on the association between social relationship constructs and recovery outcomes is .10, the power ranges from .25 to .32. If the association between social relational constructs and recovery outcomes is .24, the power is above .80. Given

that the regression path coefficient of .24 corresponds to small to medium effect size, the current sample size of 445, including 149 emerging adults with SMI and 296 middle-aged adults with SMI would be not problematic to test the research hypotheses of the current study.

Table 3. Selected Monte Carlo Simulation Results

Factor loading	Residuals of indicators	Factor correlations	Regression path	Residuals of outcomes	Lowest % of significance	Highest % of significance
.50	.36	.25	.10	.35	.258	.315
.50	.36	.25	.14	.35	.433	.509
.50	.36	.25	.16	.35	.531	.596
.50	.36	.25	.20	.35	.688	.756
.50	.36	.25	.22	.35	.749	.816
.50	.36	.25	.24	.35	.804	.864

Chapter 4: Results

This chapter reports the results of all analyses conducted to answer the research questions. Specifically, sample demographics and descriptive statistics are presented first. Confirmatory Factor Analysis (CFA) of all five social relationship constructs of *Positive Support from Family*, *Negative Interactions with Family*, *Positive Support from Friends*, *Positive Support from Romantic Partners*, and *Negative Interactions with Romantic Partners* validating the measurement structures follow. Finally, results of Structured Mean Model (SMM) analyses testing the first research question, and results of multiple group Structural Equation Modeling (SEM) analyses testing the second research question are presented.

Sample demographics

Table 4 presents the sample characteristics. More than 70% of emerging (n=120, 80.54%) and middle-aged adults with SMI (n=215, 72.64%) were female. Due to the primary purpose of NSAL, Black participants were dominant for both emerging (n=130, 87.25%) and middle-aged adults with SMI (n=235, 79.39%). In terms of income level, both emerging adults with SMI and middle-aged adults with SMI tend to be in low income level with mean poverty indices of 1.77 (SD=1.74) for emerging adults with SMI and 2.60 (SD=2.63) for middle-aged adults with SMI, respectively. An income-to-need ratio of 1.0 means that household income is at the poverty threshold, which corresponds to $8,590 for a single person and $17,650 for a four-person family in 2001 (Bernadette & Dalaker, 2002; McLoyd, Jocson, & Williams, 2016). The income level score ranges from 0 to 17. Therefore, the mean of 1.77 and 2.60 for income level among both emerging and middle-aged adults with SMI indicate that the sample of the current study were living in very low income. The mean of the years since the onset for emerging adults with SMI was 9.75 (SD=6.06) while that of middle-aged adults with SMI was 23.49 (SD=14.10).

Table 4. Characteristics of Sample (n=445)

	Emerging Adult with SMI sample (n=149)		Middle-aged adult with SMI sample (n=296)			
Variables	**n**	**%**	**n**	**%**	**X^2**	***df***
Sex					3.33	1
Male	29	19.46	81	27.36		
Female	120	80.54	215	72.64		
Race/ethnicity					4.15*	1
Black	130	87.25	235	79.39		
White	19	12.75	61	20.61		
	Mean	**SD**	**Mean**	**SD**	**t(*df*)**	
Income	1.77	1.74	2.60	2.63	3.52(443)**	
Years since the onset	9.75	6.06	23.49	14.10	11.36(438)**	

Note. SD=standard deviation; *<.05; **<.01

Descriptive statistics

Next, descriptive statistics for all variables consisting of five social relationship constructs and mental health recovery variables were examined. Even though all social relationship indicators were included in the current study as categorical variables with response options from 1 to 4 (or from 1 to 7), its means, standard deviations, skewness, and kurtosis are reported in Table 5 to understand the distribution of variables. Except for FS2 and FR1, items had response options from 1 to 4. On average, emerging and middle-aged adults with SMI had moderate levels of positive interactions with family, friends, and romantic partners, having means in ranges of 2 to 3. With regard to negative interactions with family, friends, and romantic partners, participants had low to moderate levels, having means in ranges of 1 to 2.

Table 5. Number of Valid Responses, Means and Standard Deviations of Social Relationship Variables (n=445)

Variables	n	M	SD	Skew	Kurt
Positive support from family					
FS1: How often do people in your family help you out?	445	2.65	1.09	-.39	2.39
FS2: How often do you see, write, or talk on the telephone with family or relatives who do not live with you? (1 – 7)	443	6.06	1.31	-1.91	6.80
FS3: How many people in your family would help you out if you needed help?	443	7.06	10.04	4.13	25.39
FS4: How close do you feel towards your family members?	443	3.45	.80	-1.46	4.51
FS5: Would you say your family members are very close in their feelings toward each other?	440	3.27	.84	-1.06	3.53
FS6: How often do your family members make you feel loved and cared for?	441	3.31	.86	-1.01	3.05
FS7: How often do your family members listen to you talk about your private problems and concerns?	443	2.79	1.09	-.29	1.75
FS8: How often do your family members express interest and concern in your well-being?	443	3.28	.93	-1.07	3.08
Negative interactions with family					
FN1: How often do your family members make too many demands on you?	443	2.28	1.07	.38	1.91
FN2: How often do your family members criticize you and the things you do?	441	2.26	1.04	.45	2.06
FN3: How often do your family members try to take advantage of you?	443	1.86	1.05	.94	2.59
Positive support from friends					
FR1: How often do you see, write, or talk on the telephone with your friends? (1 – 7)	445	5.64	1.86	-1.67	4.92
FR2: How often do your friends help you out?	430	2.46	1.05	-.27	2.38
FR3: How close do you feel towards your friends?	430	3.30	.79	-.92	3.18
FR4: How many people are close to your family who are not really blood or marriage related but who are treated just like a relative?	438	8.84	15.69	4.33	23.89
FR5: How often does that person (i.e., family like friends) help you out?	444	2.24	1.34	-.34	1.97
Positive support from romantic partners					
RS1: How much does your spouse/partner really care about you?	441	2.12	1.83	-.15	1.18

Variables	n	M	SD	Skew	Kurt
RS2: How much does he/she appreciate you?	440	1.99	1.74	-.06	1.25
RS3: How much can you rely on him/her?	436	1.99	1.76	-.05	1.23
RS4: How much would he/she help you out financially if you needed it?	440	2.02	1.78	-.07	1.22
RS5: How much would he/she take care of you if you were sick?	442	2.08	1.79	-.13	1.22
RS6: How often does your spouse/partner make you feel loved and cared for?	441	1.95	1.71	-.05	1.27
Negative interactions with romantic partners					
RN1: How often does he/she make too many demands on you?	443	1.48	1.39	.36	1.87
RN2: How often does he/she argue with you?	439	1.48	1.40	.38	1.89
RN3: How often does he/she criticize you?	436	1.35	1.32	.54	2.16
RN4: How often does he/she let you down when you are counting on him/her?	439	1.33	1.29	.52	2.18
RN5: How often does he/she get on your nerves?	440	1.60	1.46	.25	1.72

Note. n=valid responses; M=mean; SD=standard deviation; Skew=Skewness; Kurt=Kurtosis. Except were indicated, values could range from 1 – 4.

For mental health recovery, means and standard deviations of clinical recovery (severity of symptoms, K6), existential recovery (hope), and physical recovery (exercise), and the proportion of affirmative response for functional recovery (being employed) and social recovery (neighborhood participation) for emerging and middle-aged adults with SMI group are shown in Table 6. Given that K6 scores above 13 are considered severe levels of psychological distress, the mean of 16.95 for emerging adults with SMI and 17.33 for middle-aged adults with SMI suggest high levels of symptoms among participants. Also, given that hope has a possible score range from 1 to 8, and exercise has a range of 0 to 9, the level of hope among participants seems high and the level of exercise seems moderate in both groups. In terms of functional recovery, more than 65% of emerging adults with SMI and about 56% of middle-aged adults with SMI were employed. Less than 60% of emerging adults with SMI and about 70% of middle-aged adults with SMI were in contact with or participating in the neighborhood.

The levels of mental health recovery between emerging and middle-aged adults with SMI were not statistically significantly different, except for social recovery. Middle-aged adults with SMI were more likely to involve neighborhood activity compared to emerging adults with SMI.

Table 6. Mental Health Recovery for Emerging and Middle-aged Adults with SMI

	Emerging Adult with SMI sample (n=149)		**Middle-aged adult with SMI sample (n=296)**			
Variables	**N**	**%**	**N**	**%**	**X^2**	***df***
Functional Recovery					3.10ns	1
Not working	52	34.90	129	43.58		
Working	97	65.10	167	56.42		
Social Recovery					6.38*	1
No participation	64	42.95	91	30.85		
Neighborhood participation	85	57.05	204	69.15		
	Mean	**SD**	**Mean**	**SD**	**t(*df*)**	
Clinical Recovery	16.95	5.06	17.33	5.61	.63(363)ns	
Existential Recovery	6.16	1.83	5.96	1.88	-1.060(439)ns	
Physical Recovery	4.60	2.07	4.80	2.35	.90(443)ns	

Note. SD=standard deviation. ns=not significant; * p<.05

Measurement structure

CFA was conducted to determine the measurement structure of social relationships among emerging and middle-aged adults with SMI. Overall, the initial hypothesized models were revised reiteratively to enhance psychometric rigor by eliminating weak items from the social relationship constructs. The analysis began with evaluation of CFAs for each of the constructs and then evaluation of the measurement structure as a whole. Throughout the analyses examining the measurement structure, the marker variable technique was used for identification and the default estimator of WLSMV for categorical variable was used. As the current study has a relatively small portion of missing data, the pairwise deletion was used to handle missing data.

Positive support from family. The first construct, *Positive Support from Family* was initially hypothesized using 8 items, FS1, FS2, FS3, FS4, FS5, FS6, FS7, and FS8. The list of questions is shown in Table 7 and the initial hypothesized CFA model of *Positive Support from Family* is pictured in Figure 5.

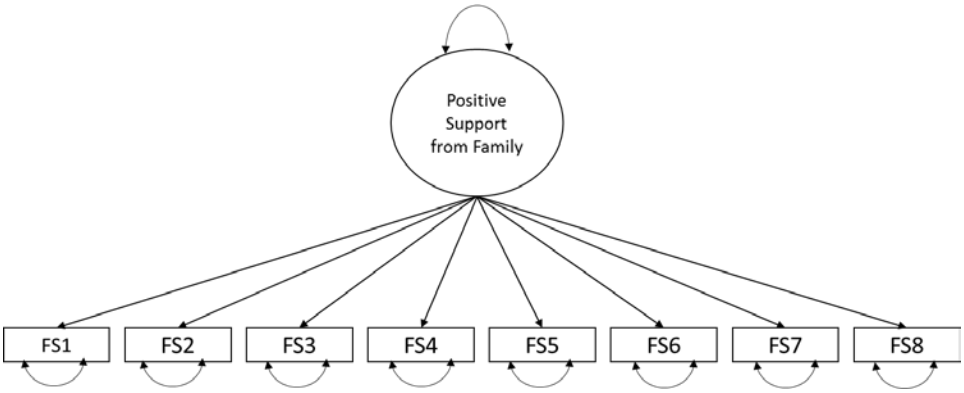

Figure 5. Initial Hypothesized CFA Model of Positive Support from Family

Table 7. Indicators of Positive Support from Family

Items	Questions	Values
FS1	How often do people in your family help you out?	1-4
FS2	How often do you see, write, or talk on the telephone with family or relatives who do not live with you?	1-7
FS3	How many people in your family would help you out if you needed help?	Continuous (0-97)
FS4	How close do you feel towards your family members?	1-4
FS5	Would you say your family members are very close in their feelings toward each other?	1-4
FS6	How often do your family members make you feel loved and cared for?	1-4
FS7	How often do your family members listen to you talk about your private problems and concerns?	1-4
FS8	How often do your family members express interest and concern in your well-being?	1-4

Initial CFA results of *Positive Support from Family* are illustrated in Table 8. Model fit, as measured by CFI and TLI, was .980 and .972, respectively, suggesting very good fit, while

RMSEA was .092 [90% CI .074 .111], suggesting mediocre fit. Although all indicators were loaded statistically significantly on this construct, the standardized factor loadings of some indicators such as FS1, FS2, and FS3 were small and this construct only accounted for a small amount of variances (i.e., less than 30%) of those indicators. For this reason, these three items of FS1, FS2, and FS3 were pruned. Also, for further model fit improvement, the residuals of FS4 and FS5 were correlated in recognition of the similarity in phrase between two items (i.e., *closeness in feeling* of respondents toward family members and *closeness in feeling* among family members).

Table 8. Initial CFA Model Statistics for Positive Support from Family (Standardized)

Items	**Estimate**	**S.E.**	**Est/S.E.**	***p*-value**	**R^2**	**R^2 *sig*.**
FS1	.517	.035	14.635	<.001	.268	<.001
FS2	.492	.043	11.509	<.001	.242	<.001
FS3	.405	.025	16.159	<.001	.164	<.001
FS4	.852	.023	37.602	<.001	.726	<.001
FS5	.721	.029	25.050	<.001	.520	<.001
FS6	.903	.018	51.497	<.001	.816	<.001
FS7	.721	.026	27.626	<.001	.520	<.001
FS8	.885	.018	47.840	<.001	.783	<.001

Note. $\chi 2_{(df=20)}$=95.940, *p*<.001; RMSEA=.092 [90% CI .074 .111]; CFI=.980; TLI=.972

The final CFA results of *Positive Support from Family* are illustrated in Table 9 and displayed in Figure 6. Model fit statistics of the final CFA model, as measured by CFI and TLI, suggest very good fit while RMSEA suggests mediocre fit ($\chi^2(df=4)=15.225$, $p<.001$; RMSEA=.080 [90% CI .040 .124]; CFI=.996; TLI=.990). In this final CFA model, all indicators were loaded statistically significantly on this construct, and the standardized factor loadings of indicators were substantial. Therefore, the current measurement structure of *Positive Support from Family* was retained for subsequent analyses.

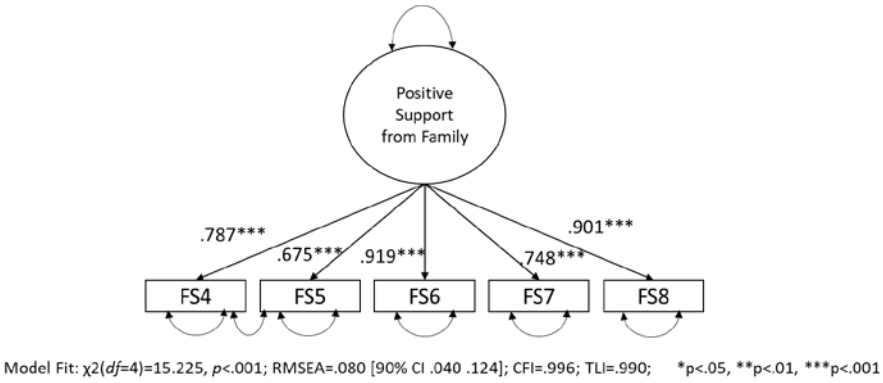

Figure 6. Final CFA Model of Positive Support from Family

Table 9. Final CFA Model Statistics for Positive Support from Family (Standardized)

Items	Estimate	S.E.	Est/S.E.	*p*-value	R^2	R^2 *sig*.
FS4	.787	.029	26.783	<.001	.619	<.001
FS5	.675	.035	19.375	<.001	.456	<.001
FS6	.919	.017	54.223	<.001	.845	<.001
FS7	.748	.026	28.441	<.001	.560	<.001
FS8	.901	.019	48.396	<.001	.812	<.001

Note. $\chi 2_{(df=4)}$=15.225, *p*<.001; RMSEA=.080 [90% CI .040 .124]; CFI=.996; TLI=.990

Negative interactions with family. The second social relationship construct of this study was *Negative Interactions with Family*, created using three items of FN1, FN2, and FN3. These three items were listed in Table 10 and the initial hypothesized model was displayed in Figure 7.

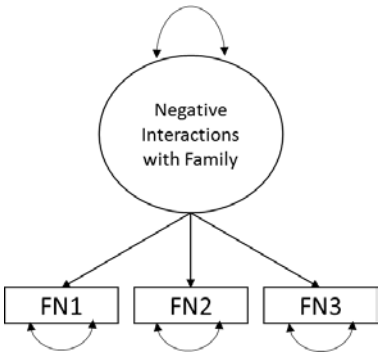

Figure 7. Initial Hypothesized CFA Model of Negative Interactions with Family

Table 10. Indicators of Negative Interactions with Family

Items	Questions	Values
FN1	How often do your family members make too many demands on you?	1-4
FN2	How often do your family members criticize you and the things you do?	1-4
FN3	How often do your family members try to take advantage of you?	1-4

Initial CFA results are presented in Table 11 and pictured in Figure 8. Model fit statistics indicate perfect fit because this is a saturated model. A saturated model means that there are as many estimated parameters as observed data points, so model fit statistics cannot be used to evaluate the model. However, factor loadings of all indicators were statistically significant and substantial, so the current CFA model of *Negative Interactions with Family* was retained.

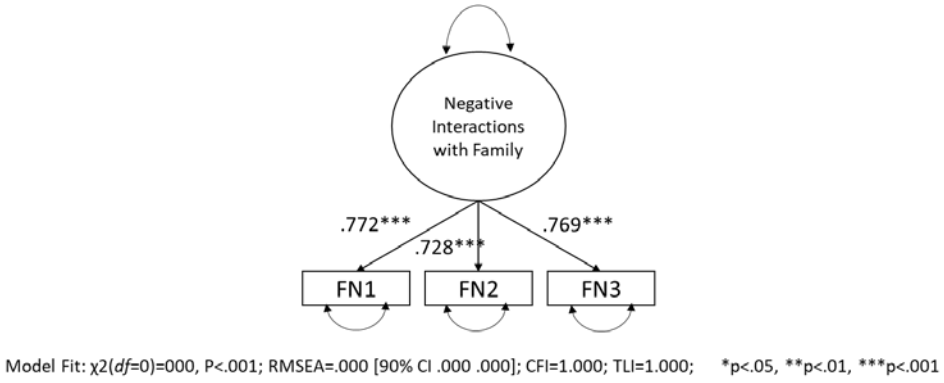

Figure 8. Final CFA Model of Negative Interactions with Family

Table 11. Initial/Final CFA Model Statistics for Negative Interactions with Family (Standardized)

Items	Estimate	S.E.	Est/S.E.	*p*-value	R^2	R^2 *sig*.
FN1	.772	.038	20.278	<.001	.596	<.001
FN2	.728	.037	19.820	<.001	.530	<.001
FN3	.769	.037	20.836	<.001	.591	<.001

Note. $\chi 2_{(df=0)}$=000, *p*<.001; RMSEA=.000 [90% CI .000 .000]; CFI=.000; TLI=.000

Positive support from friends. The third construct, *Positive Support from Friends* was initially hypothesized using 5 items, FR1, FR2, FR3, FR4, and FR5. The list of questions is shown in Table 12 and the initial hypothesized CFA model of *Positive Support from Friends* is pictured in Figure 9.

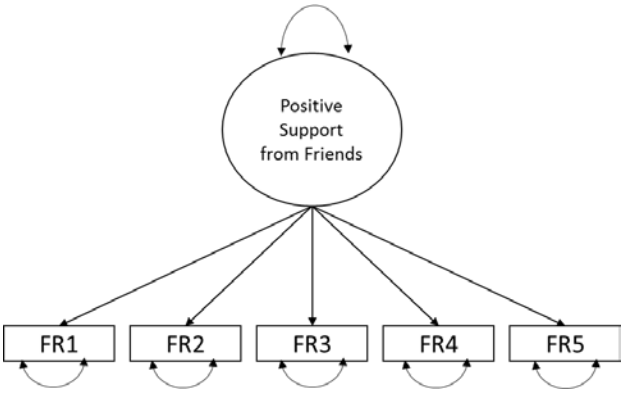

Figure 9. Initial Hypothesized CFA Model of Positive Support from Friends

Table 12. Indicators of Positive Support from Friends

Items	Questions	Values
FR1	How often do you see, write, or talk on the telephone with your friends?	1-7
FR2	How often do your friends help you out?	1-4
FR3	How close do you feel towards your friends?	1-4
FR4	How many people are close to your family who are not really blood or marriage related but who are treated just like a relative?	Continuous (0-100)
FR5	How often does that person (i.e., family like friends) help you out?	1-4

Initial CFA results are illustrated in Table 13. Model fit, as measured by CFI and TLI, was .995 and .990, respectively, suggesting very good fit, and RMSEA was .042 [90% CI .000 .086], suggesting close fit. Also, all indicators were loaded statistically significantly on the construct of *Positive Support from Friends*. However, the standardized factor loading of FR4 was small (β=.250) and the construct of *Positive Support from Friends* accounted only 6.2% of the variance in FR4. Therefore, it was decided by the researcher to prune this item.

Table 13. Initial CFA Model Statistics for Positive Support from Friends (Standardized)

Items	Estimate	S.E.	Est/S.E.	*p*-value	R^2	R^2 *sig*.
FR1	.670	.039	17.226	<.001	.448	<.001
FR2	.731	.034	21.810	<.001	.535	<.001
FR3	.748	.038	19.458	<.001	.560	<.001
FR4	.250	.042	5.974	<.001	.062	<.001
FR5	.598	.041	14.524	<.001	.358	<.001

Note. $\chi 2_{(df=5)}$=8.944, *p*=.111; RMSEA=.042 [90% CI .000 .086]; CFI=.995; TLI=.990

The final CFA results of *Positive Support from Friends* are illustrated in Table 14 and displayed in Figure 10. Model fit statistics of the final CFA model, as measured by CFI and TLI, suggest very good fit while RMSEA suggests acceptable fit ($\chi 2(df=2)=6.315$, $p<.001$; RMSEA=.070 [90% CI .011 .134]; CFI=.994; TLI=.983). In this final CFA model, all indicators were loaded statistically significantly on this construct, and the standardized factor loadings of indicators were substantial. Therefore, the current measurement structure of *Positive Support from Friends* was retained for subsequent analyses.

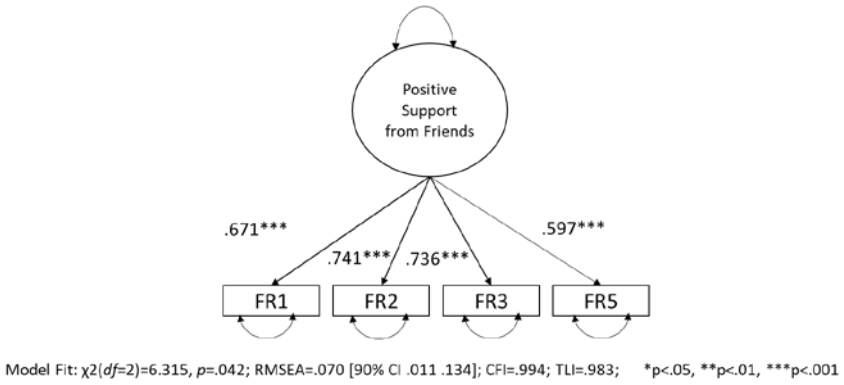

Figure 10. Final CFA Model of Positive Support from Friends

Table 14. Final CFA Model Statistics for Positive Support from Friends (Standardized)

Items	Estimate	S.E.	Est/S.E.	*p*-value	R^2	R^2 *sig*.
FR1	.671	.040	16.750	<.001	.450	<.001
FR2	.741	.035	21.417	<.001	.549	<.001
FR3	.736	.040	18.445	<.001	.541	<.001
FR5	.597	.042	14.129	<.001	.356	<.001

Note. $\chi 2_{(df=2)}$=6.315, *p*=.042; RMSEA=.070 [90% CI .011 .134]; CFI=.994; TLI=.983

Positive support from romantic partners. The fourth construct, *Positive Support from Romantic Partners* was hypothesized using 6 items, RS1, RS2, RS3, RS4, RS5, and RS6. The list of questions is shown in Table 15 and the initial hypothesized CFA model of *Positive Support from Romantic Partners* is pictured in Figure 11.

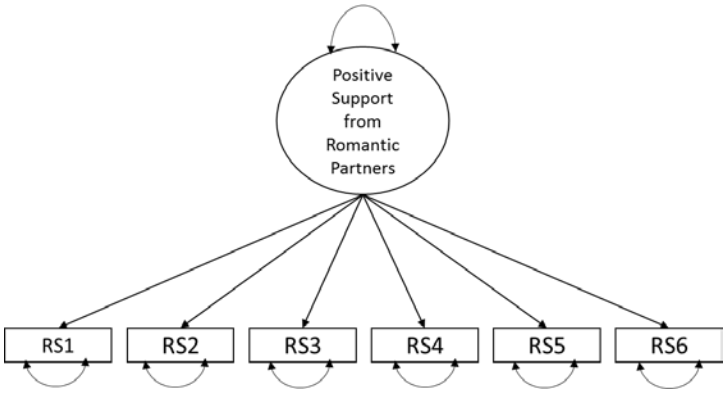

Figure 11. Initial Hypothesized CFA Model of Positive Support from Romantic Partners

Table 15. Indicators of Positive Support from Romantic Partners

Items	Questions	Values
RS1	How much does your spouse/partner really care about you?	1-4
RS2	How much does he/she appreciate you?	1-4
RS3	How much can you rely on him/her?	1-4
RS4	How much would he/she help you out financially if you needed it?	1-4
RS5	How much would he/she take care of you if you were sick?	1-4
RS6	How often does your spouse/partner make you feel loved and cared for?	1-4

Initial CFA results are presented in Table 16. Model fit, as measured by CFI and TLI, was 1.000 and 1.000, respectively, suggesting very good fit, while RMSEA was .063 [90% CI .137 .205], suggesting acceptable fit. Also, all indicators were loaded statistically significantly on the construct of *Positive Support from Romantic Partners* so the initial CFA was retained.

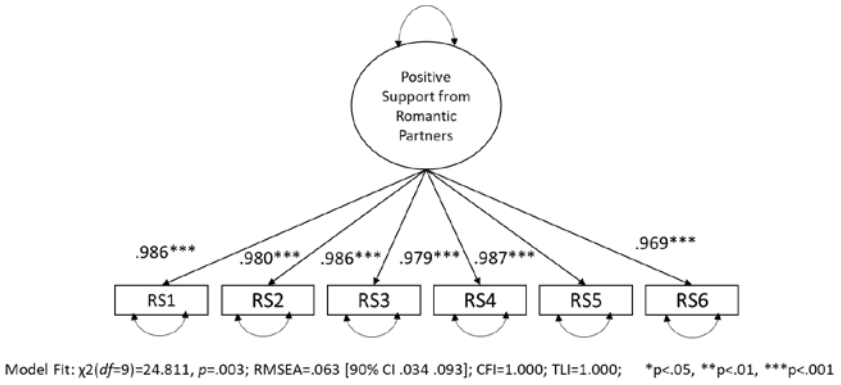

Figure 12. Final CFA model of Positive Support from Romantic Partners

Table 16. Initial CFA Statistics for Positive Support from Romantic Partners (Standardized)

Items	Estimate	S.E.	Est/S.E.	*p*-value	R^2	R^2 *sig*.
RS1	.986	.003	334.512	<.001	.972	<.001
RS2	.980	.004	267.472	<.001	.960	<.001
RS3	.986	.003	322.094	<.001	.973	<.001
RS4	.979	.004	245.970	<.001	.958	<.001
RS5	.987	.003	342.821	<.001	.974	<.001
RS6	.969	.005	187.034	<.001	.938	<.001

Note. $\chi 2_{(df=9)}$=24.811, *p*=.003; RMSEA=.063 [90% CI .034 .093]; CFI=1.000; TLI=1.000

Negative interactions with romantic partners. The final construct of *Negative Interactions with Romantic Partners* was hypothesized using 5 items, RN1, RN2, RN3, RN4, and RN5. The list of questions is shown in Table 17 and the initial hypothesized CFA model of *Negative Interactions with Romantic Partners* is pictured in Figure 13.

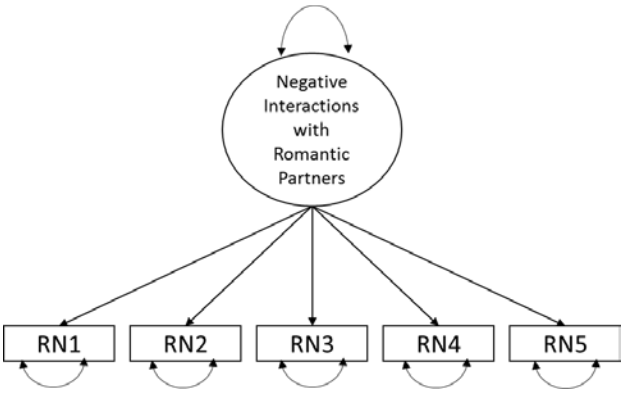

Figure 13. Initial CFA Model of Negative Interactions with Romantic Partners

Table 17. Indicators of Negative Interactions with Romantic Partners

Items	Questions	Values
RN1	How often does he/she make too many demands on you?	1-4
RN2	How often does he/she argue with you?	1-4
RN3	How often does he/she criticize you?	1-4
RN4	How often does he/she let you down when you are counting on him/her?	1-4
RN5	How often does he/she get on your nerves?	1-4

Initial CFA results are presented in Table 18. Model fit, as measured by CFI and TLI, was .999 and .999, respectively, suggesting very good fit, and RMSEA was .100 [90% CI .066 .139], suggesting poor fit. However, further pruning was not attempted because all indicators were loaded statistically significantly on the construct of *Negative Interactions with Romantic Partners* and this construct accounted significant amount of variances in indicators, as evidenced by R^2 (Kline, 2015).

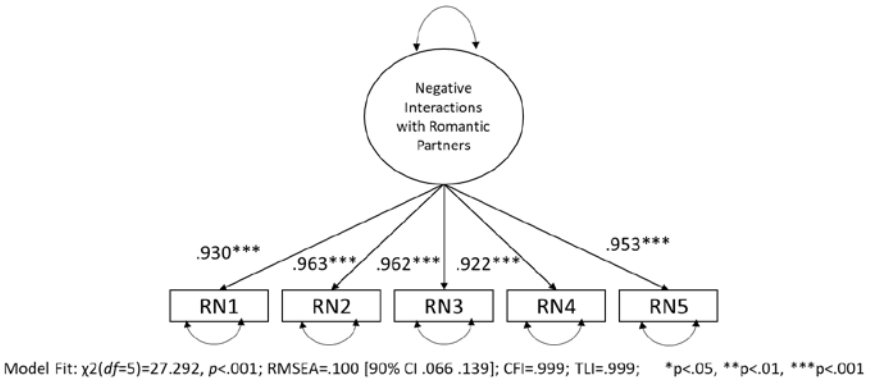

Figure 14. Final CFA Model of Negative Interactions with Romantic Partners

Table 18. Initial CFA Statistics for Negative Interactions with Romantic Partners

Items	**Estimate**	**S.E.**	**Est/S.E.**	***p*-value**	**R^2**	**R^2 *sig*.**
RN1	.930	.008	113.882	<.001	.865	<.001
RN2	.963	.005	187.732	<.001	.928	<.001
RN3	.962	.006	163.243	<.001	.926	<.001
RN4	.922	.010	92.233	<.001	.850	<.001
RN5	.953	.007	132.754	<.001	.908	<.001

Note. $\chi 2_{(df=5)}$=27.292, *p*<.001; RMSEA=.100 [90% CI .066 .139]; CFI=.999; TLI=.999

Comprehensive CFA. Once the measurement structure of all individual CFAs was established, comprehensive CFA was conducted to examine how the measurement structure of the individual CFAs maintained. Figure 15 illustrates the structure of this comprehensive CFA that includes the final versions of the constructs of *Positive Support from Family*, *Negative Interactions with Family*, *Positive Support from Friends*, *Positive Support from Romantic Partners*, and *Negative Interactions with Romantic Partners*.

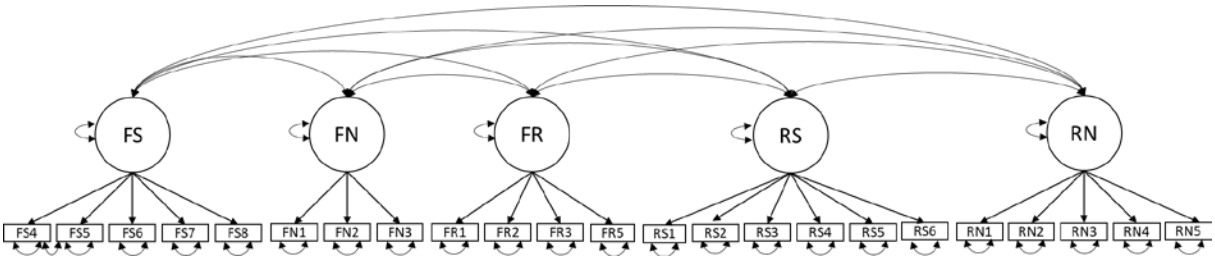

Figure 15. CFA Model of All Five Social Relationship Constructs

Table 19. Final Statistics for Comprehensive CFA Model

Items	Estimate	S.E.	Est/S.E.	*p*-value	R^2	R^2 *sig*.
Positive Support from Family						
FS4	.781	.029	26.897	<.001	.610	<.001
FS5	.674	.034	19.627	<.001	.455	<.001
FS6	.926	.017	54.396	<.001	.858	<.001
FS7	.748	.027	28.181	<.001	.560	<.001
FS8	.897	.018	48.534	<.001	.805	<.001
Negative Interactions with Family						
FN1	.631	.038	16.553	<.001	.399	<.001
FN2	.762	.036	20.991	<.001	.581	<.001
FN3	.885	.037	23.881	<.001	.783	<.001
Positive Support from Friends						
FR1	.673	.042	15.900	<.001	.453	<.001
FR2	.723	.040	18.298	<.001	.522	<.001
FR3	.770	.043	17.932	<.001	.593	<.001
FR5	.580	.044	13.073	<.001	.336	<.001
Positive Support from Romantic Partners						
RS1	.986	.003	335.750	<.001	.971	<.001
RS2	.977	.004	263.182	<.001	.955	<.001
RS3	.987	.003	323.287	<.001	.973	<.001
RS4	.980	.004	256.726	<.001	.961	<.001
RS5	.988	.003	348.498	<.001	.975	<.001
RS6	.966	.005	188.530	<.001	.934	<.001
Negative Interactions with Romantic Partners						
RN1	.936	.008	115.422	<.001	.876	<.001
RN2	.965	.006	166.748	<.001	.932	<.001
RN3	.959	.007	138.698	<.001	.919	<.001
RN4	.919	.011	80.884	<.001	.844	<.001
RN5	.953	.008	115.747	<.001	.907	<.001

Note. $\chi 2_{(df=219)}$=333.229, *p*<.001; RMSEA=.034 [90% CI .027 .041]; CFI=.999; TLI=.999

The final CFA statistics of comprehensive model of five constructs are illustrated in Table 19. This comprehensive CFA had good model fit: $\chi 2(df=219)=333.229$, $p<.001$; RMSEA=.034 [90% CI .027 .041]; CFI=.999; TLI=.999. All indicators were loaded statistically significantly on the constructs, and the standardized factor loadings of indicators were substantial.

Structured Mean Model

To answer the first research question, exploring the differences in social relational characteristics between emerging adults with SMI and middle-aged adults with SMI, SMM analysis was administered. As described, SMM begins with CFA for a single group, then expands the model to assess differences in factor means between groups. To achieve this, SMM seeks the strong measurement invariance between the groups and then, evaluate the differences in factor means by comparing the factor intercepts in each group. In the current study, a CFA model validated in the previous section was used. Invariance testing was conducted using DIFFTEST option of Mplus because the current study used WLSMV for estimation.

Table 20 presents invariance testing results. Firstly, configural invariance between emerging and middle-aged adults with SMI was tested by imposing the same measurement structure (i.e., factor loadings freed and fixed in the same fashion) to emerging and middle-aged adults with SMI. The configural invariance model was good: $\chi^2(df=452)=583.189$, $p<.001$; RMSEA=.036 [90% CI .027 .044]; CFI=.999; TLI=.999. This indicates that emerging and middle-aged adults with SMI have the same pattern of fixed and freed parameters for each social relationship construct. Secondly, weak invariance between emerging and middle-aged adults with SMI was tested by constraining corresponding factor loadings to be equal between two groups. The weak invariance model was also good: $\chi^2(df=470)=598.281$, $p<.001$; RMSEA=.035

[90% CI .026 .043]; CFI=.999; TLI=.999. Weak invariance between emerging and middle-aged adults with SMI was tenable given that the chi-square difference between configural invariance model and weak invariance model was not statistically significant: $\chi^2(df=18)=15.810$, $p=.606$. Lastly, strong invariance between emerging and middle-aged adults with SMI was tested by constraining corresponding factor loadings and thresholds equal between two groups. The strong invariance model was good: $\chi^2(df=514)=649.845$, $p<.001$; RMSEA=.034 [90% CI .026 .042]; CFI=.999; TLI=.999 and DIFFTEST results supported strong invariance between emerging and middle-aged adults with SMI: $\chi^2(df=44)=57.585$, $p=.082$.

Table 20. Invariance Testing Results

Steps		***df***	**χ2**	***p***	**RMSEA**	**CFI**	**TLI**
Step1 (Configural)		452	583.189	<.001	.036 (.027 .044)	.999	.999
Step2 (Weak)		470	598.281	<.001	.035 (.026 .043)	.999	.999
	Δ	18	15.810	.606			
Step3 (Strong)		514	649.845	<.001	.034 (.026 .042)	.999	.999
	Δ	44	57.585	.082			

Table 21 presents SMM statistics. As unstandardized estimates show, corresponding factor loadings between emerging and middle-aged adults with SMI were constrained to be equal. Also, as standardized estimates and its *p*-values show, all factor loadings were statistically significantly loaded on each construct and substantial.

Table 21. SMM Results

	Emerging adults with SMI			Middle-aged adults with SMI		
Items	Unstandardized Estimate	Standardized Estimate	*p*-value	Unstandardized Estimate	Standardized Estimate	*p*-value
FS4	1.000	.828	<.001	1.000	.751	<.001
FS5	.808	.667	<.001	.808	.677	<.001
FS6	2.180	.917	<.001	2.180	.928	<.001
FS7	.971	.760	<.001	.971	.742	<.001
FS8	1.809	.920	<.001	1.809	.900	<.001
FN1	1.000	.524	<.001	1.000	.676	<.001
FN2	1.267	.720	<.001	1.267	.758	<.001
FN3	1.931	.905	<.001	1.931	.871	<.001
FR1	1.000	.629	<.001	1.000	.707	<.001
FR2	.960	.720	<.001	.960	.693	<.001
FR3	1.254	.749	<.001	1.254	.782	<.001
FR5	.745	.556	<.001	.745	.598	<.001
RS1	1.000	.993	<.001	1.000	.986	<.001
RS2	.860	.984	<.001	.860	.981	<.001
RS3	1.378	.968	<.001	1.378	.992	<.001
RS4	.893	.973	<.001	.893	.982	<.001
RS5	1.059	.979	<.001	1.059	.987	<.001
RS6	.841	.980	<.001	.841	.980	<.001
RN1	1.000	.935	<.001	1.000	.935	<.001
RN2	1.351	.972	<.001	1.351	.963	<.001
RN3	1.256	.970	<.001	1.256	.957	<.001
RN4	.991	.890	<.001	.991	.934	<.001
RN5	1.165	.954	<.001	1.165	.951	<.001

After strong invariance was established, the differences in latent factor means between emerging and middle-aged adults with SMI were examined. This task was conducted by setting factor means of middle-aged adults with SMI to zero. By doing this, factor means of emerging adults with SMI are differences between emerging and middle-aged adults with SMI.

Table 22 shows standardized factor means, its p-value, and effect size for *Positive Support from Family*, *Negative Interactions with Family, Positive Support from Friends, Positive Support from Romantic Partners*, and *Negative Interactions with Romantic Partners*. Not all of

factor means were different; only *Negative Interactions with Family* and *Positive Support from Friends*, and *Negative Interactions with Romantic Partners* were different between emerging and middle-aged adults with SMI. Specifically, emerging adults with SMI had higher levels of *Negative Interactions with Family*, higher levels of *Positive Support from Friends*, and higher levels of *Negative Interactions with Romantic Partners*.

To better understand these factor mean differences, the effect sizes were computed by dividing the factor means by the square root of the variance (i.e., standard deviation) (Thompson & Green, 2006). The effect size for *Negative Interactions with Family* was .54, suggesting medium effect size; the effect size for *Positive Support from Friends* was .40, suggesting small to medium effect size; the effect size for *Negative Interactions with Romantic Partners* was .27, corresponding to small effect size (Cohen, 1988).

Table 22. Mean Differences between Emerging and Middle-aged Adults with SMI (Standardized)

Factors	**Means**	***p***	**Effect size**
Positive Support from Family	-.070	.533	
Negative Interactions with Family	.545	<.001	.54
Positive Support from Friends	.404	.001	.40
Positive Support from Romantic Partners	.222	.074	
Negative Interactions with Romantic Partners	.271	.029	.27

However, these results were from a model without any control variables included. As hypothesized, the mean level of factors may change after controlling for sex, race, income level, and the years since the onset. Therefore, the same analyses were conducted after including covariates in the model. As shown in Table 23, similar patterns of factor loadings were replicated and all factor loadings were statistically significantly loaded on the factors in a model with covariates as well.

Table 23. SMM Results for the Model with Covariates

	Emerging adults with SMI			Middle-aged adults with SMI		
Items	Unstandardized Estimate	Standardized Estimate	*p*-value	Unstandardized Estimate	Standardized Estimate	*p*-value
FS4	1.000	.856	<.001	1.000	.745	<.001
FS5	.803	.729	<.001	.803	.667	<.001
FS6	2.306	.918	<.001	2.306	.932	<.001
FS7	1.004	.771	<.001	1.004	.746	<.001
FS8	1.938	.906	<.001	1.938	.908	<.001
FN1	1.000	.521	<.001	1.000	.677	<.001
FN2	1.257	.762	<.001	1.257	.756	<.001
FN3	2.065	.879	<.001	2.065	.885	<.001
FR1	1.000	.666	<.001	1.000	.680	<.001
FR2	1.135	.677	<.001	1.135	.725	<.001
FR3	1.297	.815	<.001	1.297	.769	<.001
FR5	.911	.510	<.001	.911	.645	<.001
RS1	1.000	.994	<.001	1.000	.986	<.001
RS2	.890	.984	<.001	.890	.983	<.001
RS3	1.449	.969	<.001	1.449	.993	<.001
RS4	.927	.972	<.001	.927	.984	<.001
RS5	1.064	.979	<.001	1.064	.988	<.001
RS6	.857	.980	<.001	.857	.982	<.001
RN1	1.000	.949	<.001	1.000	.937	<.001
RN2	1.350	.971	<.001	1.350	.964	<.001
RN3	1.330	.970	<.001	1.330	.963	<.001
RN4	.994	.890	<.001	.994	.936	<.001
RN5	1.184	.962	<.001	1.184	.954	<.001

Table 24 presents standardized factor means and its p-value for *Positive Support from Family, Negative Interactions with Family, Positive Support from Friends, Positive Support from Romantic Partners*, and *Negative Interactions with Romantic Partners*, after controlling for sex, race, income level and the years since the onset. After controlling for control variables, there was no statistically significant difference in any factor means.

Table 24. Mean Differences between Emerging and Middle-aged Adults with SMI after Adjusting for Control Variables (Standardized)

Factors	Means	*p*	Effect size
Positive Support from Family	.238	.475	-
Negative Interactions with Family	.382	.354	-
Positive Support from Friends	.348	.344	-
Positive Support from Romantic Partners	.313	.389	-
Negative Interactions with Romantic Partners	.529	.093	-

In sum, the social relational characteristics of emerging adults with SMI were different from middle-aged adults with SMI, characterized as more family negative interactions, more friend support, and more negative interactions with romantic partners. However, after adjusting for sex, race, income level, and the years since the onset, such differences between emerging and middle-aged adults with SMI were not statistically significant anymore. Together, this may suggest that social relationships that emerging adults with SMI experience may differ from middle-aged adults with SMI, but this may not purely stem from developmental differences between these two groups. Sex, race, income level, and the years since the onset may interact with being emerging or middle-aged adults with SMI.

Table 25. Summary of Hypothesis Testing (Research Question 1)

Research Question 1: Do social relational characteristics of emerging adults with SMI differ from middle-aged adults with SMI, after controlling for sex, race, income level, and the years since the onset?	
Hypotheses	**Supported (Yes/No)**
Hypothesis 1-1: Emerging adults with SMI will have less positive support from family than middle-aged adults with SMI, after controlling for sex, race, income level, and the years since the onset.	No

Hypothesis 1-2: Emerging adults with SMI will have more negative interactions with family than middle-aged adults with SMI, after controlling for sex, race, income level, and the years since the onset.	No*
Hypothesis 1-3: Emerging adults with SMI will have more positive support from friends than middle-aged adults with SMI, after controlling for sex, race, income level, and the years since the onset.	No*
Hypothesis 1-4: Emerging adults with SMI will have more positive support from romantic partners than middle-aged adults with SMI, after controlling for sex, race, income level, and the years since the onset.	No
Hypothesis 1-5: Emerging adults with SMI will have less negative interactions with romantic partners than middle-aged adults with SMI, after controlling for sex, race, income level, and the years since the onset.	No*

Note.* There were statistically significant differences between emerging and middle-aged adults with SMI. However, the differences became not significant after adjusting for sex, race, income level, and the years since the onset.

Multiple group SEM

To answer the second research question, exploring the differences in the association of social relationships and mental health recovery between emerging and middle-aged adults with SMI, a series of multiple group SEM analyses were conducted. Normally, SEM analysis is conducted in two steps: (a) evaluating the measurement part of the model and (b) evaluating the structural part of the model separately. This is called two-step modeling (Kline, 2013). Two-step modeling is better than one-step modeling, which analyzes the measurement and the structural component of the model simultaneously in a single analysis, in that researchers can easily locate the source of poor fit when results indicate poor fit of the model. In the current study, however, two-step modeling is not necessary because the measurement structure was validated in advance. If poor model fit is indicated, the source would be the structural part of the model, not the measurement part of the model. Thus, this study conducted multiple group SEM analysis directly, without CFA examining the measurement structure of the model.

In the current study, multiple group SEM begun with estimating a model for each group separately. In this unconstrained model, the structural path coefficients were freely estimated for each group. As a second step, the same model with all corresponding structural path coefficients constrained to be equal was estimated. These two models (i.e., the model with freely estimated coefficients and the model with constraints), then, were compared in terms of model fit using DIFFTEST option. Results suggested a presence of structural path coefficients that were statistically significantly different between emerging and middle-aged adults with SMI. Therefore, the source of differences was explored through multiple model fit comparisons.

To be specific, as a first step, the structural model linking social relationship constructs to five domains of mental health recovery, after controlling for sex, race, income level, and the year since the onset was estimated for emerging (n=149) and middle-aged adults with SMI (n=296), separately. This unconstrained multiple group model had good model fit: $\chi^2(df=878)=1113.485$, $p<.001$; RMSEA=.035 [90% CI .028 .041]; CFI=.998; TLI=.998. Table 26 shows path coefficients for emerging and middle-aged adults with SMI in the unconstrained model.

In this freely estimated model, *Positive Support from Friends* was positively associated with clinical recovery (b=1.552, β=.214, *p*=.031); *Positive Support from Family* was positively associated with existential recovery for emerging adults with SMI (b=.778, β=.319, *p*=.031). In contrast, for middle-aged adults with SMI, *Negative Interactions with Family* (b=-2.224, β=.263, *p*<.001) and *Negative Interactions with Romantic Partners* (b=-2.473, β=-.407, *p*=.001) were negatively associated with clinical recovery. Similarly, *Negative Interactions with Family* was negatively associated with existential recovery (b=-.726, β=-.259, *p*=<.001) while *Positive Support from Friends* was positively associated with existential recovery (b=.368, β=.133,

p=.029). However, it should be noted that it is not assumed that these differences are statistically significantly different between emerging and middle-aged adults with SMI.

Table 26. Path Coefficients in the Unconstrained Model

	Emerging adults with SMI				Middle-aged adults with SMI			
path	**b**	**S.E.**	***p***	**β**	**b**	**S.E.**	***p***	**β**
FS→ Clinical R	1.324	.916	.148	.197	-.809	.562	.150	-.105
FN→ Clinical R	.101	1.153	.930	.011	-2.224	.564	<.001	-.263
FR→ Clinical R	1.552	.720	.031	.214	.891	.550	.106	.107
RS→ Clinical R	.597	.771	.439	.100	1.405	.759	.064	.245
RN→ Clinical R	-.889	.665	.181	-.158	-2.473	.743	.001	-.407
FS→ Existential R	.778	.361	.031	.319	-.068	.167	.684	-.026
FN→ Existential R	.564	.454	.214	.162	-.726	.187	<.001	-.259
FR→ Existential R	.033	.261	.901	.012	.368	.168	.029	.133
RS→ Existential R	.383	.311	.218	.177	.309	.194	.112	.162
RN→ Existential R	-.562	.299	.061	-.275	-.280	.199	.160	-.139
FS→ Functional R	.017	.090	.849	.027	-.070	.049	.154	-.103
FN→ Functional R	.040	.125	.747	.044	-.049	.050	.328	-.066
FR→ Functional R	-.034	.070	.628	-.049	.013	.045	.773	.018
RS→ Functional R	-.041	.083	.616	-.073	.021	.050	.678	.041
RN→ Functional R	.067	.093	.470	.126	-.065	.054	.229	-.121
FS→ Physical R	.172	.336	.610	.062	.211	.204	.302	.066
FN→ Physical R	.271	.460	.556	.069	.016	.208	.941	.004
FR→ Physical R	.280	.254	.271	.094	.434	.229	.058	.126
RS→ Physical R	-.069	.266	.795	-.028	-.440	.257	.087	-.185
RN→ Physical R	-.138	.263	.598	-.060	.362	.261	.165	.144
FS→ Social R	-.145	.172	.399	-.220	.005	.046	.914	.008
FN→ Social R	-.065	.143	.647	-.069	.029	.058	.621	.041
FR→ Social R	.179	.202	.374	.251	.135	.158	.395	.197
RS→ Social R	.007	.074	.920	.013	-.013	.057	.819	-.028
RN→ Social R	.094	.120	.434	.169	.019	.062	.763	.038

In terms of path coefficients associated with control variables, being White was negatively associated with clinical recovery (b=-.004, β=.000, *p*<.001) while income level was positively associated with clinical recovery of emerging adults with SMI (b=.627, β=.218, *p*=.011). Being female was also negatively associated with physical recovery of emerging adults

with SMI (b=-1.064, β=-.205, *p*=.010). Similar to emerging adults with SMI, being White was negatively associated with clinical recovery (b=-.123, β=-.009, *p*<.001) and income level was positively associated with clinical recovery of middle-aged adults with SMI (b=686, β=.321, *p*<.001). For existential recovery, being female (b=.839, β=.201, *p*<.001) and income level (b=187, β=.263, *p*<.001) were positively associated with existential recovery and the years since the onset was negatively associated with existential recovery of middle-aged adults with SMI (b=-.024, β=-.184, *p*=.001). In addition, income level was positively associated with functional recovery (b=.078, β=.416, *p*<.001) and physical recovery (b=.251, β=.284, *p*<.001) of middle-aged adults with SMI.

Table 27. Coefficients of Control Variables in the Unconstrained Model

	Emerging adults with SMI				**Middle-aged adults with SMI**			
path	**b**	**S.E.**	***p***	**β**	**b**	**S.E.**	***p***	**β**
Female→ Clinical R	-.116	1.069	.913	-.009	1.417	.808	.079	.113
White→ Clinical R	-.004	.000	<.001	.000	-.123	.000	<.001	-.009
Income→ Clinical R	.627	.246	.011	.218	.686	.137	<.001	.321
Onset→ Clinical R	-.047	.076	.532	-.057	-.035	.028	.204	-.087
Female→ Existential R	-.359	.428	.401	-.078	.839	.234	<.001	.201
White→ Existential R	.018	.492	.971	.003	-.380	.261	.145	-.083
Income→ Existential R	.163	.114	.152	.156	.187	.046	<.001	.263
Onset→ Existential R	-.006	.025	.808	-.020	-.024	.007	.001	-.184
Female→ Functional R	.055	.116	.637	.045	.066	.065	.310	.060
White→ Functional R	.101	.157	.519	.071	.027	.066	.677	.023
Income→ Functional R	.047	.046	.305	.171	.078	.014	<.001	.416
Onset→ Functional R	-.004	.008	.588	-.053	-.003	.002	.181	-.075
Female→ Physical R	-1.064	.413	.010	-.205	-.301	.330	.362	-.058
White→ Physical R	.261	.556	.639	.042	.371	.309	.230	.065
Income→ Physical R	.072	.114	.527	.061	.251	.062	<.001	.284
Onset→ Physical R	-.016	.029	.587	-.045	-.005	.009	.547	-.032
Female→ Social R	-.171	.223	.444	-.137	-.069	.104	.507	-.067
White→ Social R	-.176	.229	.443	-.119	.033	.078	.673	.029
Income→ Social R	-.071	.080	.375	-.251	.011	.018	.538	.062
Onset→ Social R	-.004	.008	.594	-.051	-.002	.003	.550	-.049

To see if there is any statistically significant difference in the structural paths between emerging and middle-aged adults with SMI, all structural parameter estimates were constrained to be equal first. The model fit of this fully constrained model was then compared with the unconstrained model (i.e., the freely estimated model), using DIFFTEST option. DIFFTEST result showed that $\chi^2(df=45)=63.611$, $p=.035$; CFI=.998; TLI=.998, indicating the presence of significant parameter differences in the structural paths between the two groups.

To identify which path coefficients are different between these two groups, a series of nested model tests were conducted. Specifically, the model with no constraint was compared with the model with one path coefficient fixed to be equal across groups, and this process was repeated for all path coefficients. Table 28 shows the path coefficients released each time and its corresponding DIFFTEST results. A series of nested model fit tests suggested that FS→ clinical recovery, FN→ clinical recovery, White→ clinical recovery, FS→ existential recovery, FN→ existential recovery, female→ existential recovery, income→ functional recovery, and income→ social recovery differ between emerging and middle-aged adults with SMI. To confirm this, the partially constrained model (i.e., the model with these 8 path coefficients freed but the other coefficients fixed to be equal between the two groups) was compared with the unconstrained model. DIFFTEST result indicated no statistically significant difference ($\chi^2(df=37)=42.515$, $p=.246$), suggesting no further path coefficient different between the two groups.

Table 28. DIFFTEST Results

Released path	Chi-square Test for Difference Testing	Decision
FS→ Clinical R	χ^2(df=1)=6.740, p=.009	Statistically Different
FN→ Clinical R	χ^2(df=1)=4.863, p=.027	Statistically Different
FR→ Clinical R	χ^2(df=1)=1.186, p=.276	Not Different
RS→ Clinical R	χ^2(df=1)=.823, p=.364	Not Different
RN→ Clinical R	χ^2(df=1)=3.560, p=.059	Not Different
FEMALE→ Clinical R	χ^2(df=1)=2.300, p=.129	Not Different

WHITE→ Clinical R	χ^2(df=1)=infinity, *p*<.000	Statistically Different
INCOME→ Clinical R	χ^2(df=1)=1.044, *p*=.307	Not Different
ONSET→ Clinical R	χ^2(df=1)=.023, *p*=.878	Not Different
FS→ Existential R	χ^2(df=1)=6.461, *p*=.011	Statistically Different
FN→ Existential R	χ^2(df=1)=8.011, *p*=.005	Statistically Different
FR→ Existential R	χ^2(df=1)=2.424, *p*=.120	Not Different
RS→ Existential R	χ^2(df=1)=1.000, *p*=.317	Not Different
RN→ Existential R	χ^2(df=1)=1.375, *p*=.241	Not Different
FEMALE→ Existential R	χ^2(df=1)=7.024, *p*=.008	Statistically Different
WHITE→ Existential R	χ^2(df=1)=1.512, *p*=.219	Not Different
INCOME→ Existential R	χ^2(df=1)=.038, *p*=.846	Not Different
ONSET→ Existential R	χ^2(df=1)=.482, *p*=.487	Not Different
FS→ Functional R	χ^2(df=1)=1.093, *p*=.296	Not Different
FN→ Functional R	χ^2(df=1)=.552, *p*=.458	Not Different
FR→ Functional R	χ^2(df=1)=.331, *p*=.565	Not Different
RS→ Functional R	χ^2(df=1)=1.349, *p*=.246	Not Different
RN→ Functional R	χ^2(df=1)=3.721, *p*=.054	Not Different
FEMALE→ Functional R	χ^2(df=1)=.002, *p*=.966	Not Different
WHITE→ Functional R	χ^2(df=1)=.392, *p*=.531	Not Different
INCOME→ Functional R	χ^2(df=1)=7.284, *p*=.007	Statistically Different
ONSET→ Functional R	χ^2(df=1)=.039, *p*=.843	Not Different
FS→ Physical R	χ^2(df=1)=1.000, *p*=.317	Not Different
FN→ Physical R	χ^2(df=1)=.471, *p*=.492	Not Different
FR→ Physical R	χ^2(df=1)=1.076, *p*=.300	Not Different
RS→ Physical R	χ^2(df=1)=1.554, *p*=.213	Not Different
RN→ Physical R	χ^2(df=1)=1.086, *p*=.297	Not Different
FEMALE→ Physical R	χ^2(df=1)=2.083, *p*=.149	Not Different
WHITE→ Physical R	χ^2(df=1)=.030, *p*=.862	Not Different
INCOME→ Physical R	χ^2(df=1)=2.897, *p*=.089	Not Different
ONSET→ Physical R	χ^2(df=1)=.116, *p*=.733	Not Different
FS→ Social R	χ^2(df=1)=1.894, *p*=.169	Not Different
FN→ Social R	χ^2(df=1)=1.001, *p*=.317	Not Different
FR→ Social R	χ^2(df=1)=1.107, *p*=.293	Not Different
RS→ Social R	χ^2(df=1)=1.002, *p*=.317	Not Different
RN→ Social R	χ^2(df=1)=1.807, *p*=.179	Not Different
FEMALE→ Social R	χ^2(df=1)=.641, *p*=.423	Not Different
WHITE→ Social R	χ^2(df=1)=2.203, *p*=.138	Not Different
INCOME→ Social R	χ^2(df=1)=10.887, *p*=.001	Statistically Different
ONSET→ Social R	χ^2(df=1)=1.131, *p*=.288	Not Different

This partially constrained model had good model fit: χ^2 (*df*=935)=1197.181, *p*<.001; RMSEA=.036 [90% CI .029 .042]; CFI=.998; TLI=.998. Table 29 and Table 30 shows path

coefficients in the partially constrained model (final model). In Table 29 and Table 30, highlighted in bold indicate path coefficients estimated separately for emerging and middle-aged adults with SMI. The remaining coefficients (not in bold) were estimated same for both emerging and middle-aged adults with SMI.

Overall, the association between social relationships and mental health recovery was similar between emerging and middle-aged adults with SMI. *Positive Support from Friends* was positively associated with clinical recovery (b=1.401, β=.173, *p*=.004) but *Negative Interactions with Romantic Partners* was negatively associated with clinical recovery (b=-1.195, β=-.239, *p*=.019) for both emerging and middle-aged adults with SMI. Also, *Positive Support from Friends* was positively associated with existential recovery (b=.429, β=.145, *p*=.005) but *Negative Interactions with Romantic Partners* was negatively associated with existential recovery (b=-.342, β=-.187, *p*=.048) for both emerging and middle-aged adults with SMI. Finally, *Positive Support from Friends* was positively associated with physical recovery (b=.468, β=.140, *p*=.010) and social recovery (b=632, β=.371, *p*<.001) for both emerging and middle-aged adults with SMI.

However, *Positive Support from Family* was positively associated with clinical recovery only among emerging adults with SMI (b=2.929, β=.457, *p*=.005) while *Negative Interactions with Family* was negatively associated with clinical recovery only among middle-aged adults with SMI (b=-2.743, β=-.323, *p*<.001). *Negative Interactions with Family* was also negatively associated with existential recovery (b=-.861, β=-.305, *p*<.001), but only among middle-aged adults with SMI.

Table 29. Path Coefficients in the Partially Constrained Model

	Emerging adults with SMI				Middle-aged adults with SMI			
path	**b**	**S.E.**	***p***	**β**	**b**	**S.E.**	***p***	**β**
FS→ Clinical R	**2.929**	**1.045**	**.005**	**.457**	**-.869**	**.561**	**.121**	**-.113**
FN→ Clinical R	**2.610**	**1.550**	**.092**	**.270**	**-2.743**	**.600**	**<.001**	**-.323**
FR→ Clinical R	1.401	.480	.004	.173	1.401	.480	.004	.173
RS→ Clinical R	.423	.638	.507	.044	.423	.638	.507	.074
RN→ Clinical R	-1.195	.508	.019	-.239	-1.195	.508	.019	-.198
FS→ Existential R	**.630**	**.344**	**.068**	**.268**	**-.165**	**.165**	**.316**	**-.065**
FN→ Existential R	**.529**	**.525**	**.314**	**.150**	**-.861**	**.197**	**<.001**	**-.305**
FR→ Existential R	.429	.152	.005	.145	.429	.152	.005	.159
RS→ Existential R	.377	.193	.051	.108	.377	.193	.051	.199
RN→ Existential R	-.342	.173	.048	-.187	-.342	.173	.048	-.170
FS→ Functional R	-.152	.115	.184	-.116	-.152	.115	.184	-.083
FN→ Functional R	-.212	.143	.138	-.107	-.212	.143	.138	-.105
FR→ Functional R	.090	.114	.428	.054	.090	.114	.428	.047
RS→ Functional R	-.304	.157	.053	-.155	-.304	.157	.053	-.224
RN→ Functional R	.221	.137	.106	.216	-.221	.137	.106	.154
FS→ Physical R	-.005	.162	.975	-.002	-.005	.162	.975	-.002
FN→ Physical R	-.063	.191	.744	-.016	-.063	.191	.744	-.018
FR→ Physical R	.468	.181	.010	.140	.468	.181	.010	.140
RS→ Physical R	-.065	.259	.802	-.017	-.065	.259	.802	-.028
RN→ Physical R	-.046	.230	.841	-.022	-.046	.230	.841	-.018
FS→ Social R	-.125	.100	.209	-.093	-.125	.100	.209	-.090
FN→ Social R	.081	.127	.527	.040	.081	.127	.527	.053
FR→ Social R	.632	.111	<.001	.371	.632	.111	<.001	.431
RS→ Social R	-.079	.160	.621	-.039	-.079	.160	.621	-.077
RN→ Social R	.164	.142	.250	.157	.164	.142	.250	.150

There was a great degree of similarity between emerging and middle-aged adults with SMI regarding the effects of sex, race, income level, and the years since the onset as well. In both groups, being White was negatively associated with clinical recovery (emerging adults with SMI: b=-.004, β=.000, p<.001, middle-aged adults with SMI: b=.123, β=-.009, p<.001) while income level was positively associated with clinical recovery (b=.672, β=.234, p<.001). Also, income level was positively associated with existential recovery (b=.183, β=.260, p<.001) while the years since the onset was negatively associated with existential recovery (b=-.023, β=-.075,

p=.001). Income level was positively associated with functional recovery as well, but to a different degree between emerging (b=.143, β=.242, *p*=.039) and middle-aged adults with SMI (b=.332, β=.658, *p*<.001). However, income level was negatively associated with social recovery only for emerging adults with SMI (b=-.197, β=-.326, *p*=.002) and being female was positively associated with existential recovery only for middle-aged adults with SMI (b=.839, β=.201, *p*<.001).

Table 30. Coefficients of Control Variables in the Partially Constrained Model

	Emerging adults with SMI				**Middle-aged adults with SMI**			
path	**b**	**S.E.**	***p***	**β**	**b**	**S.E.**	***p***	**β**
FEMALE→ Clinical R	.860	.645	.182	.068	.860	.645	.182	.069
WHITE→ Clinical R	**-.004**	**.000**	**<.001**	**.000**	**-.123**	**.000**	**<.001**	**-.009**
INCOME→ Clinical R	.672	.120	<.001	.234	.672	.120	<.001	.316
ONSET→ Clinical R	-.036	.026	.159	-.044	-.036	.026	.159	-.091
FEMALE→ Existential R	**-.359**	**.401**	**.401**	**-.078**	**.839**	**.234**	**<.001**	**.201**
WHITE→ Existential R	-.293	.203	.203	-.053	-.293	.230	.203	-.064
INCOME→ Existential R	.183	<.001	<.001	.174	.183	.043	<.001	.260
ONSET→ Existential R	-.023	.001	.001	-.075	-.023	.007	.001	-.173
FEMALE→ Functional R	.146	.369	.369	.056	.146	.163	.369	.049
WHITE→ Functional R	.100	.558	.558	.032	.100	.170	.558	.030
INCOME→ Functional R	**.143**	**.039**	**.039**	**.242**	**.332**	**.030**	**<.001**	**.658**
ONSET→ Functional R	-.007	.189	.189	-.043	-.007	.006	.189	-.077
FEMALE→ Physical R	-.599	.020	.020	-.115	-.599	.258	.020	-.116
WHITE→ Physical R	.345	.201	.201	.056	.345	.270	.201	.061
INCOME→ Physical R	.211	<.001	<.001	.179	.211	.054	<.001	.240
ONSET→ Physical R	-.006	.461	.461	-.018	-.006	.008	.461	-.038
FEMALE→ Social R	-.278	.071	.071	-.104	-.278	.154	.071	-.123
WHITE→ Social R	-.052	.756	.756	-.016	-.052	.167	.756	-.021
INCOME→ Social R	**-.197**	**.002**	**.002**	**-.326**	**.033**	**.033**	**.321**	**.087**
ONSET→ Social R	-.005	.336	.336	-.030	-.005	.005	.336	-.071

Figure 16 and Figure 17 depict the differences in the association of social relationships and mental health recovery for emerging and middle-aged adults with SMI. As explained above, for emerging adults with SMI, *Positive Support from Family* and income level (i.e., lines in blue) were uniquely associated with clinical recovery and social recovery respectively. For middle-aged adults with SMI, on the other hand, *Negative Interactions with Family* (i.e., lines in blue) was uniquely associated with clinical and existential recovery. Being female (i.e., line in blue) was uniquely associated with existential recovery of middle-aged adults with SMI.

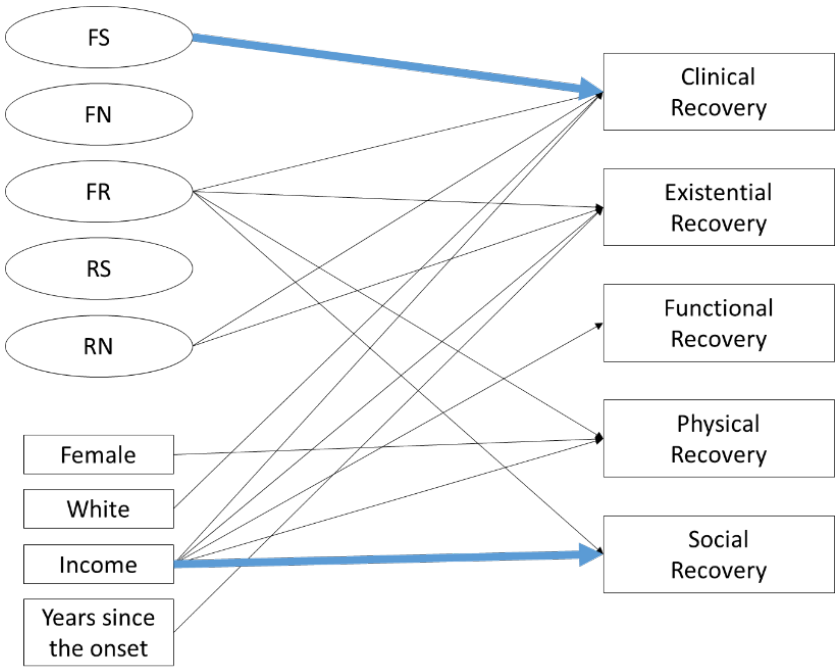

Figure 16. The Association of Social Relationships and Mental Health Recovery for Emerging Adults with SMI

Note. FS=Positive Support from Family, FN=Negative Interactions with Family, FR=Positive Support from Friends, RS=Positive Support from Romantic Partners, RN=Negative Interactions with Romantic Partners. Paths only show the statistically significant association among social relationship latent variables, control variables, manifest mental health recovery variables. Fine

black lines indicate the paths that were statistically significant for both emerging and middle-aged adults with SMI. Bold Blue lines indicate the paths that were statistically significant only for emerging adults with SMI.

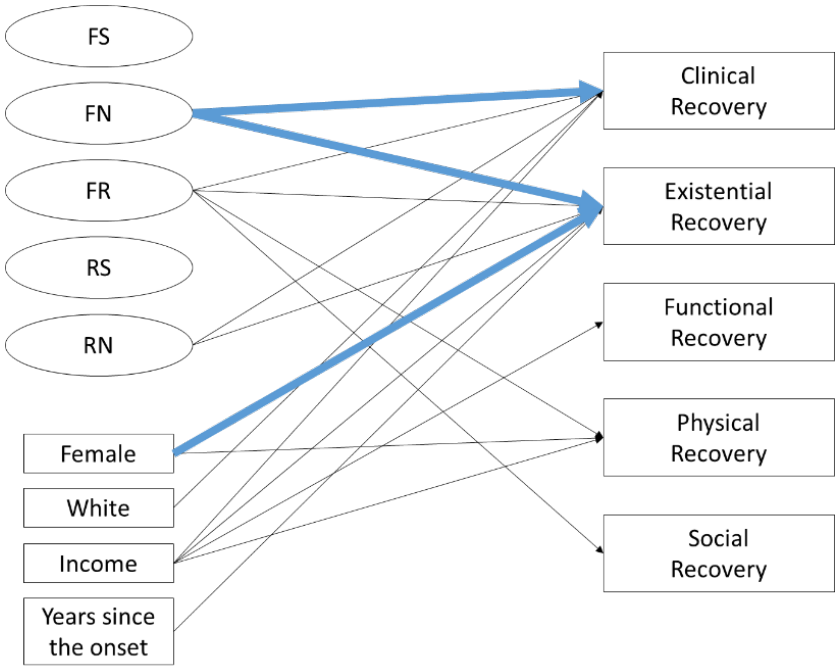

Figure 17. The Association of Social Relationships and Mental Health Recovery for Middle-aged Adults with SMI

Note. FS=Positive Support from Family, FN=Negative Interactions with Family, FR=Positive Support from Friends, RS=Positive Support from Romantic Partners, RN=Negative Interactions with Romantic Partners. Paths only show the statistically significant association among social relationship latent variables, control variables, manifest mental health recovery variables. Fine black lines indicate the paths that were statistically significant for both emerging and middle-aged adults with SMI. Bold Blue lines indicate the paths that were statistically significant only for middle-aged adults with SMI.

In sum, there were a few differences and many similarities between emerging and middle-aged adults with SMI in regard to the role of social relationships in mental health recovery. Positive support from family was statistically significantly associated with clinical recovery but only among emerging adults with SMI. Negative interactions with family were also statistically significantly associated with clinical recovery but only among middle-aged adults with SMI. Despite these differences, positive support from friends was important for both emerging and middle-aged adults with SMI. Positive support from friends was statistically significantly associated with clinical, existential, physical, and social domains of mental health recovery for both emerging and middle-aged adults with SMI. Table 31 summarizes hypothesis testing results for research question 2. This will be discussed in detail in the following chapter along with other findings.

Table 31. Summary of Hypothesis Testing (Research Question 2)

Research Question 2: Do the influences of family, friends, and romantic partners on mental health recovery differ between emerging and middle-aged adults with SMI, after controlling for sex, race, income level, and the years since the onset?	
Clinical recovery	
Hypothesis	**Supported (Yes/No)**
Hypothesis 2-1-1: Among emerging adults with SMI, positive support from family will not be associated with the severity of symptoms after controlling for sex, race, income level, and the years since the onset while it will be associated among middle-aged adults with SMI.	No*
Hypothesis 2-1-2: Among emerging adults with SMI, negative interactions with family will not be associated with the severity of symptoms after controlling for sex, race, income level, and the years since the onset while it will be associated among middle-aged adults with SMI.	Yes
Hypothesis 2-1-3: Among emerging adults with SMI, positive support from friends will be associated with the severity of symptoms after controlling for sex, race, income	No**

level, and the years since the onset while it will not be associated among middle-aged adults with SMI.	
Hypothesis 2-1-4: Among emerging adults with SMI, positive support from romantic partners will be associated with the severity of symptoms after controlling for sex, race, income level, and the years since the onset while it will not be associated among middle-aged adults with SMI.	No***
Hypothesis 2-1-5: Among emerging adults with SMI, negative interactions with romantic partners will be associated with the severity of symptoms after controlling for sex, race, income level, and the years since the onset while it will not be associated among middle-aged adults with SMI.	No**
Existential recovery	
Hypothesis	**Supported (Yes/No)**
Hypothesis 2-2-1: Among emerging adults with SMI, positive support from family will not be associated with the level of hope after controlling for sex, race, income level, and the years since the onset while it will be associated among middle-aged adults with SMI.	No***
Hypothesis 2-2-2: Among emerging adults with SMI, negative interactions with family will not be associated with the level of hope after controlling for sex, race, income level, and the years since the onset while it will be associated among middle-aged adults with SMI.	Yes
Hypothesis 2-2-3: Among emerging adults with SMI, positive support from friends will be associated with the level of hope after controlling for sex, race, income level, and the years since the onset while it will not be associated among middle-aged adults with SMI.	No**
Hypothesis 2-2-4: Among emerging adults with SMI, positive support from romantic partners will be associated with the level of hope after controlling for sex, race, income level, and the years since the onset while it will not be associated among middle-aged adults with SMI.	No***
Hypothesis 2-2-5: Among emerging adults with SMI, negative interactions with romantic partners will be associated with the level of hope after controlling for sex, race, income level, and the years since the onset while it will not be associated among middle-aged adults with SMI.	No**
Functional Recovery	
Hypothesis	**Supported (Yes/No)**
Hypothesis 2-3-1: Among emerging adults with SMI, positive support from family will	No***

not be associated with employment status after controlling for sex, race, income level, and the years since the onset while it will be associated among middle-aged adults with SMI.	
Hypothesis 2-3-2: Among emerging adults with SMI, negative interactions with family will not be associated with employment status after controlling for sex, race, income level, and the years since the onset while it will be associated among middle-aged adults with SMI.	No***
Hypothesis 2-3-3: Among emerging adults with SMI, positive support from friends will be associated with employment status after controlling for sex, race, income level, and the years since the onset while it will not be associated with middle-aged adults with SMI.	No***
Hypothesis 2-3-4: Among emerging adults with SMI, positive support from romantic partners will be associated with employment status after controlling for sex, race, income level, and the years since the onset while it will not be associated among middle-aged adults with SMI.	No***
Hypothesis 2-3-5: Among emerging adults with SMI, negative interactions with romantic partners will be associated with employment status after controlling for sex, race, income level, and the years since the onset while it will not be associated among middle-aged adults with SMI.	No***
Physical Recovery	
Hypothesis	**Supported (Yes/No)**
Hypothesis 2-4-1: Among emerging adults with SMI, positive support from family will not be associated with the level of exercise after controlling for sex, race, income level, and the years since the onset while it will be associated among middle-aged adults with SMI.	No***
Hypothesis 2-4-2: Among emerging adults with SMI, negative interactions with family will not be associated with the level of exercise after controlling for sex, race, income level, and the years since the onset while it will be associated among middle-aged adults with SMI.	No***
Hypothesis 2-4-3: Among emerging adults with SMI, positive support from friends will be associated with the level of exercise after controlling for sex, race, income level, and the years since the onset while it will not be associated among middle-aged adults with SMI.	No**
Hypothesis 2-4-4: Among emerging adults with SMI, positive support from romantic partners will be associated with the level of exercise after controlling for sex, race, income level, and the years since the onset while it will not be associated among middle-aged adults with SMI.	No***

Hypothesis 2-4-5: Among emerging adults with SMI, negative interactions with romantic partners will be associated with the level of exercise after controlling for sex, race, income level, and the years since the onset while it will not be associated among middle-aged adults with SMI.	No**
Social Recovery	
Hypothesis	**Supported (Yes/No)**
Hypothesis 2-5-1: Among emerging adults with SMI, positive support from family will not be associated with neighborhood participation after controlling for sex, race, income level, and the years since the onset while it will be associated among middle-aged adults with SMI.	No***
Hypothesis 2-5-2: Among emerging adults with SMI, negative interactions with family will not be associated with neighborhood participation after controlling for sex, race, income level, and the years since the onset while it will be associated among middle-aged adults with SMI.	No***
Hypothesis 2-5-3: Among emerging adults with SMI, positive support from friends will be associated with neighborhood participation after controlling for sex, race, income level, and the years since the onset while it will not be associated among middle-aged adults with SMI.	No**
Hypothesis 2-5-4: Among emerging adults with SMI, positive support from romantic partners will be associated with neighborhood participation after controlling for sex, race, income level, and the years since the onset while it will not be associated among middle-aged adults with SMI.	No***
Hypothesis 2-5-5: Among emerging adults with SMI, negative interactions with romantic partners will be associated with neighborhood participation after controlling for sex, race, income level, and the years since the onset while it will not be associated among middle-aged adults with SMI.	No***

Note. * As opposed to the hypothesis, positive support from family was associated with the severity of symptoms after controlling for sex, race, income level, and the years since the onset among emerging adults with SMI while it was not associated among middle-aged adults with SMI. ** Associated among both emerging and middle-aged adults with SMI. *** Not associated among both emerging and middle-aged adults with SMI.

Chapter 5: Discussion

Chapter 5 summarizes the major findings of this exploratory study, discusses tentative implications for theory, future research, and innovations in mental health services, and addresses limitations. Overall, findings suggest that, for this sample, emerging adults with SMI are different from middle-aged adults with SMI in a few ways; however, they also have many similarities in terms of the social relational characteristics and the influence of those relationships on mental health recovery. The first part of the discussion focuses on the social relational characteristics of emerging adults with SMI as compared to middle-aged adults with SMI (Research Question 1). Then, the discussion will move into the differences and similarities between emerging and middle-aged adults with SMI regarding the role of social relationships in mental health recovery (Research Question 2). Finally, implications for theory, empirical mental health research, and social work practice are presented, as well as a discussion of limitations and suggestions for future research.

Social relational characteristics of emerging adults with SMI (Research Question 1)

The mean levels of *Positive Support from Family*, *Negative Interactions with Family*, *Positive Support from Friends*, *Positive Support from Romantic Partners*, and *Negative Interactions with Romantic Partners* for emerging and middle-aged adults with SMI were compared. Before adjusting for sex, race, income level, and the years since the onset of SMI, there were statistically significant mean differences related to characteristics of social relationships between emerging adults with SMI and middle-aged adults with SMI. Specifically, emerging adults with SMI had higher mean levels of *Negative Interactions with Family*, *Positive Support from Friends*, and *Negative Interactions with Romantic Partners*. This means that emerging adults with SMI experienced more negative interactions with family and romantic

partners than middle-aged adults with SMI, but experienced more supportive relationships with friends.

The higher levels of negative interactions with family among emerging adults with SMI are consistent with literature. Although there is mixed evidence, emerging adults in the general population tend to experience more family strains compared to middle-aged adults in the general population (Walen & Lachman, 2000). In addition, higher levels of negative interactions with family among emerging adults with SMI may be related to the course of mental illness. Emerging adults with SMI are likely to be in the early years of mental illness. It is known that people with SMI and their family experience elevated stress and conflicts during the early years of mental illness. The onset of mental illness is often reported as a critical event that transformed the life of family, after which parents of adult children with SMI experience negative feelings such as “sorrow, anguish and constant worry,” “guilt and shame,” and “burden” (Boydell et al., 2013; Pejlert, 2001). In the literature, emerging adults with SMI also spoke of tensions with their family. Some qualitative studies reported that emerging adults with SMI felt that their parents control them too much after the onset of mental illness (Henderson & Cock, 2015). Taken together, the finding that emerging adults with SMI had higher levels of negative interactions with family than middle-aged adults with SMI may be related to both developmental characteristics and the course of mental illness in emerging adulthood.

However, the higher levels of negative interactions with romantic partners among emerging adults with SMI in this study are not consistent with literature given that romantic relationships were expected to be a major source of support for emerging adults in the general population (Furman & Wehner, 1994; Umemura et al., 2015). It is possible that the higher levels of negative interactions with romantic partners among emerging adults with SMI in this study

may be related to the course of illness, as the emergence of mental illness has been found to negatively affect marital relationships. For example, studies found that the onset of mental illness was associated with greater odds of divorce and smaller odds of remarriage among people with SMI (Idstad et al., 2015; Mojtabai et al., 2017). Some emerging adults with SMI spoke of negative consequences of having romantic relationships such as emotional burden in maintaining the relationships (Hirschfeld et al., 2005).

The finding that emerging adults with SMI had higher levels of friend support than middle-aged adults with SMI also was consistent with literature. Regardless of age, people with SMI generally have a smaller social network size than those without SMI (Hirschfeld et al., 2005; Reininghaus et al., 2008). Support networks of emerging adults with SMI tend to consist of family rather than friends (Macdonald et al., 2000). However, this study showed that emerging adults with SMI had higher levels of friend support compared to middle-aged adults with SMI despite the lack of friends common in the population with SMI. Perhaps it suggests that emerging adults with SMI, who may have had more recent onset of SMI, have maintained some of their previous friendships while middle-aged adults with SMI tend to lost the support of their friends as they age. In the study comparing social activities and social roles of emerging adults with SMI to those of people with SMI in later ages, Kaplan et al., (2012) also found that emerging adults with SMI spent more time with friends compared to older counterparts, implying that friends are likely available in emerging adulthood.

The mean difference between emerging and middle-aged adults with SMI was the largest for *Negative Interactions with Family*, followed by *Positive Support from Friend* and *Negative Interactions with Romantic Partners.* This suggests that family is the source of relationships that

exhibits the largest difference between emerging and middle-aged adults with SMI as compared to friends or romantic partners.

However, after adjusting for sex, race, income level, and the years since the onset, differences between emerging and middle-aged adults with SMI in terms of family negative interactions, friend support, and romantic partners' negative interactions were not statistically significant (See Table 25 for a summary of hypothesis testing). This might indicate that the differences between emerging adults with SMI and middle-aged adults with SMI in regard to family, friends, and romantic relationships do not purely stem from the age difference between emerging and middle-aged adults with SMI. In other words, differences in sex, race, income level, and the years since the onset between emerging and middle-aged adults with SMI may play a role making differences in the mean levels of social relationships. In fact, it seems likely that there are interactions between one's development stages and characteristics such as sex, race, income, and how long they have been managing their SMI. For example, Walen and Lachman (2000) studied social support and strain from family, friends, and romantic partners of adults in the general population and found interactions of sex and age pertaining to romantic partner relationships. While support from romantic partners was stable for women, the level of support from romantic partners for men changed across developmental stages such that younger men perceived higher support than middle-aged men.

Differences between emerging and middle-aged adults with SMI (Research Question 2)

A series of multiple group SEM analyses were conducted to explore the differential role of family, friends, and romantic partners in the mental health recovery of emerging adults with SMI as compared with middle-aged adults with SMI. The final model indicated that the association of social relationships and mental health recovery for emerging and middle-aged

adults with SMI is generally similar with a few differences related to family relationships. This section first highlights the differences in the association of social relationships and mental health recovery between emerging and middle-aged adults with SMI, and then discusses the similarities between the two groups suggested by the final model.

The role of family. The final model indicated that there were differences between emerging and middle-aged adults with SMI related to the role of family relationships in mental health recovery. For emerging adults with SMI, *Positive Support from Family* was statistically significantly associated with clinical recovery, suggesting that emerging adults with SMI who received more support from family are likely to have lower levels of psychological symptoms. However, no statistically significant association of *Positive Support from Family* was indicated for middle-aged adults with SMI.

The finding that positive support from family was associated with clinical recovery only among emerging adults with SMI is opposite of the hypothesized relationship (Hypothesis 2-1-1). Emerging adults in the general population have more friends in their core networks and receive less support from family and more support from friends compared to older generations (Levitt et al., 1993). Likewise, in the study using a sample of people in the early courses of psychosis, who were likely to be in emerging adulthood, too much support from family was indicated as a predictor of worse functioning (Erickson et al., 1998).

This unexpected finding may be related to the developmental characteristics of emerging adults. The previous literature has identified the mechanisms through which social support and negative interactions influence mental health (Lincoln, 2000). Social support – emotional support, in particular – strengthens positive psychological assets such as self-esteem and provides benefits for health and well-being. On the other hand, negative interactions instill

negative self-attributions, thus harming the health and well-being of people. Maybe for emerging adults with SMI, the psychological strengthening function could be more powerful than the negative instilling function, perhaps due to the optimistic tendency of emerging adults in general (Arnett et al., 2014). It is also possible that the positive support from family was only significant among emerging adults with SMI because they tend to live with or are in regular contact with family while it is less common among middle-aged adults with SMI (Mueser et al., 2015). Parents tend to strive to remain supportive of their adult children with SMI especially in the early years of mental illness (Shepherd et al., 2010). Thus, emerging adults with SMI may receive support from family, whereas perhaps positive family support is less available for many middle-aged adults with SMI.

For middle-aged adults with SMI, *Negative Interactions with Family* was associated with clinical recovery and existential recovery. In other words, middle-aged adults with SMI who experienced lower levels of negative interactions with family were likely to have lower levels of psychological symptoms and higher levels of hope. Several previous studies have shown that negative social interactions may have a stronger influence on various mental health outcomes than positive support (Rook, 1984; Schuster, Kessler, & Aseltine, 1990; Yanos, Rosenfield, & Horwitz, 2001). For example, using a sample of 104 people with SMI in a community mental health center, Yanos et al. (2001) studied the relative importance of negative and supportive social interactions to the quality of life as measured by the satisfaction with social relations, leisure activities, financial situations, employment, and health. In their study, after controlling for the levels of psychiatric symptoms, negative social interactions were statistically significantly associated with the quality of life while supportive social interactions were not statistically significantly associated with the quality of life. However, given that participants in their study

were in their mid-forties (mean age=45), a stronger influence of negative interactions may be more relevant to middle-aged adults with SMI rather than emerging adults with SMI.

This study is cross-sectional. Therefore, it may be the case that emerging adults with SMI experiencing lower levels of psychological symptoms are more likely to have family support, and middle-aged adults with SMI experiencing lower levels of psychological symptoms are less likely to have negative interactions with family. However, it is still interesting that positive aspects of family relationships were associated with clinical recovery of emerging adults with SMI while negative aspects of family relationships were associated with clinical recovery of middle-aged adults with SMI, not vice versa.

The importance of income. Income level was statistically significantly associated with many mental health recovery domains of all participants, but even more so for emerging adults with SMI. For middle-aged adults with SMI, income level was associated with clinical, existential, functional, and physical recovery. For emerging adults with SMI, income level was associated with all mental health recovery domains. That is, emerging adults with SMI in higher income level were less likely to experience psychological distress, more likely to have hope, more likely to be employed, and more likely to participate in daily exercise. However, counterintuitively, results indicated that emerging adults with SMI with higher income were less likely to participate in their neighborhood. In general, higher income is associated with more opportunities to interact with others (Davidson et al., 2012) so the negative direction of the relationship between income and social recovery in this study was surprising. In the literature, the receipt of disability benefits was associated with social isolation (Estroff et al., 1997) and reduced sense of purpose and motivation (Rosenheck et al., 2017). In the current study, the source of income is not known. If a portion of income is coming from disability benefits, it may

be possible that the negative association between income and social recovery found in this study is related to receiving disability benefits. Alternatively, it is also possible that emerging adults with SMI who were employed simply did not have enough time to participate in neighborhood activities, given the cross-sectional nature of this study.

It should be also noted that income level of both emerging and middle-aged adults with SMI is low. Most of the sample in this study were living with household income at the poverty line or lower than 300% of poverty line. The small amount of increase or decrease in income can make a difference.

Similarities between emerging and middle-aged adults with SMI

The importance of friendships. Inconsistent with the hypothesis, the association of social relationships and mental health recovery for emerging and middle-aged adults with SMI was similar in many ways (see Table 31). Among those, it is particularly interesting that *Positive Support from Friends* was associated with four mental health recovery domains (i.e., clinical recovery, existential recovery, physical recovery, and social recovery) for both groups. People with SMI who received more support from friends were likely to experience lower psychological symptoms, more likely to have higher levels of hope, more likely to engage in physical exercise, and more likely to participate in the neighborhood. Friends are distinctive from family and romantic partners in that they are non-kin relationships. Thus, this finding may support the importance of having non-kin relationships for overall mental health recovery consistent with previous literature. For example, Pernice-Duca and Onaga (2009) found that friend support was associated with multiple mental health recovery outcomes, implying the global benefits of friend support. Some studies directly compared non-kin support with kin support among people in the

early years of psychosis (Erickson et al., 1998; Erickson et al., 1989; Norman et al., 2005) and found consistent beneficial effects of non-kin support and inconsistent effects of kin support.

The risk of romantic relationships. *Negative Interactions with Romantic Partners* was associated with clinical and existential recovery for both emerging and middle-aged adults with SMI. People with SMI who experienced more negative interactions with their spouse or partner were likely to have higher levels of psychological symptoms and lower levels of hope. However, *Positive Support from Romantic Partners* was not statistically significantly associated with any of mental health recovery domains. Similar to family relationships, this may suggest that the negative aspect of romantic relationships is more influential than the positive aspect of romantic relationships for mental health recovery of both emerging and middle-aged adults with SMI. In the literature, some emerging adults with SMI have reported ambiguous feelings toward romantic relationships (Hirschfeld et al., 2005; Leavey, 2009) as have adults with SMI in later ages (Padgett, Henwood, Abrams, & Drake, 2008). People with SMI expressed a strong wish for a romantic partner but also concerned about emotional demands of romantic relationships. Perhaps these emotional demands are related to negative interactions that then impact mental health recovery.

The role of sex, race, income level, and the years since the onset. In this study, sex, race, income level, and the years since the onset of SMI were included to adjust for the association of social relationships and mental health recovery. The control variables were also associated with various domains of mental health recovery and the pattern of association was generally similar between emerging and middle-aged adults with SMI.

First, for both emerging and middle-aged adults with SMI, males were more likely to engage in physical exercise and Black people with SMI reported lower levels of psychological

symptoms. It is known that racial minorities have poorer physical health outcomes compared to Whites (Centers for Disease Control and Prevention, 2005; Phelan & Link, 2015). However, when it comes to mental health outcomes, racial minorities, including Blacks, reported lower lifetime prevalence rates of mental disorders than Whites after adjusting for poverty, stress exposure, and poor physical health (McGuire & Miranda, 2008). Black people showed the high prevalence of depression but this was to some extent explained by an elevated stress and a reduced opportunity to engage in health promoting behaviors (Boardman & Alexander, 2011). Nonetheless, the finding that Black people with SMI had lower levels of psychological symptoms in this study should be interpreted carefully because the effect size of race was small. Also, the majority of the sample in this study was Black. A future study using a more diverse sample should be conducted to examine the racial difference in clinical recovery.

Next, for both emerging and middle-aged adults with SMI, income level was associated with many mental health recovery domains including clinical, existential, functional, and physical recovery. This means that both emerging and middle-aged adults with SMI who had higher income were more likely to experience lower levels of psychological distress, more likely to have higher hope, and more likely to engage in physical exercise, indicating the importance of financial well-being to mental health recovery of people with SMI (Cook & Mueser, 2013; Elbogen, Tiegreen, Vaughan, & Bradford, 2011).

Finally, the years since the onset of SMI were associated with existential recovery, suggesting that people with fewer years since the onset had higher levels of hope. This finding fits with the previous literature which shows that hope tends to decrease over the course of mental illness, perhaps due to repeated relapse of symptoms. Studies showed that the level of

hope among people with SMI tends to decrease as they experience repeated relapse (Windell, Norman, Lal, & Malla, 2015).

Mental health recovery as a multidimensional construct

In the current study, mental health recovery was examined as a multidimensional construct. Instead of using one single measurement to assess mental health recovery, this study assessed mental health recovery separately for clinical recovery, existential recovery, functional recovery, physical recovery, and social recovery following the multidimensional model of mental health recovery of Whitley and Drake (2010). The final model supports the utility of this approach by showing that each dimension of mental health recovery is uniquely associated with various factors.

Among five mental health recovery domains, clinical and existential recovery were more closely associated with social relationship constructs, in general, for both emerging and middle-aged adults with SMI while functional recovery, as measured by employment status, was only related to income level. This suggests that the dimensions of recovery most closely related to social relationships maybe clinical and existential recovery, rather than functional, physical, or social recovery. In this study, clinical recovery was assessed by asking respondents about the perceived level of psychological symptoms in the past 30 days and existential recovery was assessed by asking respondents about the perceived level of hope. In contrast, functional recovery, physical recovery, and social recovery were measured by relatively quantifiable measures such as employment status, frequency of outside activity, and frequency of neighborhood contact. That is, based upon the findings from this study, social relationships may exert a stronger influence on the subjective aspects of recovery, rather than the objective aspects of recovery.

The influence of social relationships on existential recovery is consistent with literature. Tew et al., (2011) explained that social relationships are critical to recovery of people with SMI, as certain elements of recovery such as empowerment, hope, and positive self-identity are closely related to social relationships (Tew et al., 2011). Specifically, encouragement from family or friends and participating in peer support or self-help groups increase feelings of control over the life, thereby contributing to empowerment of people with SMI (Nelson et al., 2001) and developing hope (Spaniol et al., 2002).

However, the statistically significant association between social relationships and clinical recovery observed among study participants is somewhat inconsistent with the previous literature. Unlike hope, which has been shown a consistent association with social relationships, studies have found mixed results surrounding psychological symptoms and social relationships. For example, Corrigan and Phelan (2004) investigated the relationships between social support and recovery using the Recovery Assessment Scale (RAS). The RAS has five domains including (a) personal confidence and hope, (b) willingness to others, (c) goal and success orientation, (d) reliance on others, and (e) not dominated by symptoms. In their study, *not dominated by symptoms* domain, similar to clinical recovery, was not statistically significantly associated with social support.

Implications

Implications for the social convoy model. Informed by the social convoy model (Kahn & Antonucci, 1980), the current study explored the differential role of family, friends, and romantic partners in the mental health recovery of emerging adults with SMI as compared with middle-aged adults with SMI. The social convoy model posits that people maintain networks of social relationships that provide support and influence well-being, and that the relative

importance of social relationships differs by life stage. Until now, many empirical studies have tested the social convoy model by comparing the social networks of young, middle, and older adults or by following the social networks of young people longitudinally (e.g., Fuller-Iglesias Webster, & Antonucci, 2015; Levitt et al., 1993). However, such studies have tested the model with a sample of the general population. The model was untested for people with special needs, such as people with SMI.

This study begins to expand the social convoy model to the population with SMI and revealed that the social relational characteristics of emerging adults with SMI differed from middle-aged adults with SMI in some ways for members of this sample. Emerging adults with SMI were more likely to have negative interactions with family, positive support from friends, and negative interactions with romantic partners. These are consistent with the social relational characteristics of emerging adults in the general population (Levitt et al., 1993; Walen & Lachman, 2000). The social convoy model can explain the development of social relationships of people with SMI.

However, such differences did not remain significant after adjusting for sex, race, income level, and the years since the onset. This implies that the social relational differences between emerging and middle-aged adults with SMI in this study do not purely stem from the age differences between these two groups. Interactions of age with sex, race, income level, and the years since the onset of SMI may play a role in the social relational differences between emerging and middle-aged adults with SMI. The critique of the social convoy model raised in the earlier section included that the model proposes the differences in the social relationships across the life stages without fully explaining why such differences occur. The previous literature on the social convoy model tends to compare the social relational characteristics of emerging, middle-

aged and older adults in the general population not adjusting for external factors. Sex, race, income level, and the years since the onset may be potential areas in which to further explore the mechanisms through which the social networks of people change over the life course, particularly those with SMI.

Regarding the role of family, friends, and romantic partners in mental health recovery, emerging adults with SMI did not exhibit a great difference from middle-aged adults with SMI. In both groups, friend support was positively associated with mental health recovery and negative interactions with romantic partners were negatively associated with mental health recovery. The only difference between the two groups was related to family. Positive support from family was associated with mental health recovery only among emerging adults with SMI while negative interactions with family were associated with mental health recovery only among middle-aged adults with SMI. Taken together, the social convoy model can explain the differences in the social relational characteristics between emerging and middle-aged adults with SMI, but it may not explain the similarities in the role of family, friends, and romantic partners in mental health recovery among emerging and middle-aged adults with SMI. It is not clear if the social convoy model can be applied to the population with SMI. Further research should be conducted to elucidate the soundness of the social convoy model for people with SMI.

Implications for empirical mental health research. The testing of a multidimensional model of mental health recovery has implications for empirical mental health research. Whitley and Drake (2010) explained that recovery is a concept comprised of five dimensions including clinical, existential, functional, physical, and social domains. Further, they emphasized that mechanisms for achieving recovery may differ by particular people. According to Whitley and Drake (2010), clinical recovery refers to the alleviation and control of symptoms, and its

suggested measurable outcomes include hospitalization, adherence, and symptoms severity. Existential recovery refers to hope, responsibility, self-direction, and empowerment and its suggested measureable outcomes include hope, emotional well-being, spiritual well-being, sense of self-efficacy and autonomy, and sense of empowerment. Functional recovery refers to being able to participate in everyday life and in society as a member of community and its measurable outcomes include employment, education, and maintaining housing. Physical recovery refers to enjoying physical health and well-being and its measurable outcomes include caloric intake, level of exercise, weight, circumference, and substance use. Finally, social recovery refers to establishing and maintaining relationships and engaging in a rewarding social activity, community integration, and active citizenship and its measurable outcomes include social support, social capital, social activity, community integration, citizenship, and sense of belonging.

With some limitations, the current study generally followed the suggested measurable outcomes for each domain of mental health recovery. Clinical recovery was operationalized as the severity of symptoms, existential recovery was operationalized as the level of hope, functional recovery was operationalized as employment status, physical recovery was operationalized as the level of exercise, and social recovery was operationalized as neighborhood participation. Through this initial testing of the multidimensional model of mental health recovery, this study paves the way for future research. The current study provides evidence for the usefulness of the multidimensional model by showing that each domain of mental health recovery was uniquely associated with various types of social relationships.

Yet it should be noted that the majority of the sample in this study are female (75%), Black (82%), and low-income population (Mean 2.32 SD=2.40) living in the United States. Also,

physical recovery measures had low reliability (α=.432). Therefore, the usefulness of the multidimensional model should be understood in this context. Future research should continue to test a multidimensional model of mental health recovery to diverse populations using standardized measurements with high reliability.

Implications for social work practice. The current study found that emerging adults with SMI exhibit a few differences and many similarities to middle-aged adults with SMI regarding the social relational characteristics and the influence of those relationships on mental health recovery. In order to better support the mental health recovery of emerging adults with SMI, social work practices and programs that support emerging adults with SMI may benefit from integrating the differences as well as the similarities. The next section discusses tentative recommendations for social work practice to address both distinctive and common needs of emerging adults with SMI.

Addressing the distinctive needs of emerging adults with SMI. Perhaps, the most salient finding in this study is that the influence of family on mental health recovery differs between emerging and middle-aged adults with SMI. For emerging adults with SMI, positive support from family facilitates the clinical domain of mental health recovery while for middle-aged adults with SMI, negative interactions with family hinder clinical and existential domains of mental health recovery. This finding suggests that programs that enhance positive relationships with their families may lower psychological symptoms particularly for emerging adults with SMI. However, a review of programs available to emerging adults with SMI indicates that most programs for emerging adults with SMI target vocational outcomes (Di Rezze et al., 2017). Prevocational/vocational approaches were more common and programs exclusively addressing the developmental or interpersonal issues of emerging adults with SMI were lacking. Given that

social isolation is a significant issue of emerging adults with SMI (Mackrell & Lavender, 2004), coupled with this study's finding about the importance of positive family relationships for the mental health recovery of emerging adults with SMI, the lack of developmental and interpersonal approach in the current programs is concerning. Strengthening family relationships of emerging adults with SMI could be incorporated into programs supporting the recovery of emerging adults with SMI. Studies of the impact of such programmatic changes would be valuable.

Family is an important part of many programs supporting emerging adults with SMI. The TIP model helps emerging adults with SMI develop a net of supportive relationships including parents, family, and other community relationships. In addition, NAVIGATE, which is a coordinated specialty care program designed for people in the early stages of psychosis, includes family education as a core component. However, family education in the NAVIGATE program seems to focus more on handling the negative interactions within a family, rather than strengthening family positive experiences. It concerns "managing an incident of aggression in the home" or "client's ongoing problems with substance use" (Glynn et al., 2014, p. 31). While handling the negative interactions is still important, the program may benefit from replacing the negative interactions with positive interactions, not just simply minimizing the negative interactions.

Also, the NAVIGATE manual says that anyone who clients identify as family can participate in the family education program. Inviting any social relationships of clients to family education is not wrong. However, clinicians should be cognizant of potential differences within each type of social relationships and modify the actual delivery of the program in a more nuanced way.

Social relationships are also an important part of the Strengths Model Case Management (SMCM). Social relationships are viewed as environmental strengths of people with SMI. The strengths assessment includes supportive relationships as one of seven domains that clients' strengths lay. Based on the findings in this study, case managers may pay particular attention to family relationships and work to strengthen family support when they work with clients in emerging adulthood.

In this study, positive support from family was not associated with mental health recovery of middle-aged adults with SMI. It was negative interactions with family that were associated with clinical and existential recovery, implying that family support may be less important for middle-aged adults with SMI. However, this may indicate that family does not remain supportive of people with SMI when people with SMI reach the middle ages. It can be simply the case that the level of family support is low among middle-aged adults with SMI regardless of the level of clinical or existential recovery. Experts have been said that considerable changes in the social relationships are likely to occur relatively early in the course of mental illness (Addington et al., 2003; Macdonald et al., 2000). Emerging adulthood is a critical period to maintain supportive relationships as well. Early intervention can be effective not only for minimizing psychiatric symptoms but also for sustaining family relationships.

Addressing the common needs of people with SMI. In this study, regardless of age group, positive support from friends was helpful to mental health recovery. However, peer support programs designed specifically for emerging adult with SMI are critically lacking (Walker & Gowen, 2011). In this study, emerging adults with SMI had higher levels of support from friends compared to middle-aged adults with SMI. Also, Kaplan et al., (2012) revealed that emerging adults with SMI spent more time with friends compared to their older counterparts.

Together, these findings imply that non-kin relationships of people with SMI are often available during emerging adulthood, but they may diminish as people age. Interventions that help establish and maintain non-kin relationships of people with SMI might be particularly effective during emerging adulthood.

The negative interactions with romantic partners were important for both emerging and middle-aged adults with SMI in relation to clinical and existential domains of recovery. However, no interventions that target romantic relationships for people with SMI were identified (Di Rezze et al., 2017). Davidson and Cappelli (2011) pointed out that the current services helping emerging adults with SMI have largely focused on the challenges related to transitioning from child mental health care to adult mental health care, not paying attention to the distinctive needs in this population. For comprehensive care, broad ranges of domains including personal (i.e., developmental, personality, and sexuality), interpersonal (i.e., family, peers, and relationships) and social (i.e., activities, contexts, vocational, and housing) areas should be provided for emerging adults with SMI.

Findings that income level was associated with clinical, existential, functional, and physical recovery for both emerging and middle-aged adults with SMI suggest that interventions for increasing income of emerging adults with SMI should be continued. As mentioned previously, vocational programs are the most popular forms of support in the services for emerging adults with SMI (Di Rezze et al., 2017). While its potential negative impact should be cautiously monitored, efforts to provide the better economic environment for emerging adults with SMI should be continued.

The recommendations presented so far may be more relevant to Black female emerging adults with SMI living in low income, given the sample for this study. While cognizant of the

limitations of the current study, practitioners working with Black female emerging adults with SMI living in low income should be aware of the developmental distinctiveness observed in this study and try to incorporate these characteristics into the services. Indeed, the importance of developmental needs is well reflected in the National Association of Social Workers' practice standards and guidelines for social work case management and for social work with adolescents (NASW, 2003; 2013). It would be no exception for social work with emerging adults with SMI.

Limitations and suggestions for future research

Despite its contributions, the current study has several limitations that should be considered in conjunction with the findings. First, this is a cross-sectional study, and it does not establish causation. While social relationships are related to mental health recovery, the direction of the association cannot be determined. In other words, it is not clear whether social relationships influence mental health recovery or the degree to which individuals achieve mental health recovery influences the quality of social relationships of emerging and middle-aged adults with SMI in this study. A longitudinal study that examines the changes in social relationships and the impact of social relational changes on mental health recovery overtime is necessary to interpret causality.

Second, although it is meaningful to conceptualize mental health recovery as a multidimensional construct (Whitley & Drake, 2010), the measures of mental health recovery used in this study were not validated as a standardized measurement. The selection of variables for each domain of mental health recovery was guided by Whitley and Drake (2010). However, due to the limitation of variables available in the secondary dataset, the selected variables tend to depict incomplete facets of the mental health recovery domains. Although the selected variables in this study are in general agreement with the suggestion of multidimensional model, future

studies should continue test other measures of outcome. Also, physical recovery measured by two questions assessing frequency of physical activity had low reliability (α=.432). Future studies on how to operationalize a multidimensional model of mental health recovery should be conducted to guide future mental health research.

Third, this study does not include all sources of social relationships that may be critical to the mental health recovery of emerging adults with SMI. For people with SMI, relationships other than family, friends, or romantic partners are also important. Some examples include mental health professionals who can be influential to the recovery of people with SMI. Moreover, when it comes to friend relationships, only positive support from friends is available in the dataset, thereby limiting the scope of the analyses for this study. The current study cannot evaluate the effect of negative interactions with friends on the recovery of emerging adults with SMI. Given that negative interactions with family and romantic partners were found to be important, future research should explore the impact of negative interactions with friends on the mental health recovery of emerging adults with SMI to elucidate the possible negative effect of friendships.

Also, the social convoy model, the theoretical framework of this study, originally involved both the structure and function of social relationships. The composition and the size of social networks (i.e., structure of social relationships) is also of interest in the social convoy model as well as social support or social strains from social networks (i.e., function of social relationships). The social relationships conceptualized in the current study pertained to the functional aspect of social relationships (i.e., positive support and negative interactions) with little attention to the structural aspect of social relationships. Future research should investigate

the structural differences in the social relationships between emerging and middle-aged adults with SMI.

There are three levels of social convoys, which include inner, middle, and outer circle, in the social convoy model (Kahn & Antonucci, 1980). Social relationships explored in this study are family, friends, and romantic partners, all of which can be categorized into inner circle members. In order to fully understand the developmental distinctiveness in the social relationships and their relative importance in the mental health recovery of emerging adults with SMI, future research should expand the scope of investigation beyond family, friends, and romantic partners. People with SMI tend to have smaller social networks compared to those without SMI and the size of social networks of people with SMI decreases as they age (Gayer-Anderson & Morgan, 2013; Macdonald et al., 2005). Therefore, it is possible that emerging adults with SMI exhibit a greater difference related to middle and/or outer circle members.

Other limitations come from the use of NSAL. NSAL includes only Black and White populations, as its original purpose was to explore racial/ethnic differences within the Black population as compared to the White population. Other racial/ethnic groups, such as Hispanic, Asian American, and Native American populations, are not included so the distinctiveness found in this study may not apply to other racial/ethnic groups. Although the previous studies with diverse samples in the general population have found the distinctiveness of emerging adults with regard to social relationships, no studies so far have investigated young Hispanic, Asian American, and Native American populations with SMI. Future research should replicate the findings with a more diverse sample.

Additionally, the DSM-IV diagnoses included in NSAL are limited to non-psychotic diagnoses because the WMH-CIDI does not have the ability to detect psychotic diagnoses such

as schizophrenia. Accordingly, the sample in this study was people who are indicated to have major depressive disorder, bipolar disorder, and PTSD. The findings should be understood in this context. For example, the positive support from family was beneficial to the clinical recovery of emerging adults with SMI in this study while emerging adults with early psychosis who maintain frequent contact with family were more likely to relapse in the previous study (Tempier et al., 2013). This discrepancy may arise from the difference in measuring social relationships (i.e, frequency of contact versus support from family), but it could be also possible that the difference in the diagnosis between the samples play a role. Future research should be conducted using a sample including both people with psychotic and non-psychotic disorders to gain full understanding.

Finally, the timing of data collection should be noted. As explained, NSAL was collected in 2001 to 2003, so the differences found in this study may be not accurate to predict the distinctiveness of emerging adults with SMI in 2018. In particular, this study did not assess social relationships in cyberspace (e.g., on social media) among emerging adults with SMI. However, social relationships in cyberspace may be particularly important for emerging adults with SMI nowadays. Physical contacts may have been replaced with cyber contacts among emerging adult with SMI. Social relationships in cyberspace may have a stronger influence on the recovery of emerging adults with SMI. Future research should incorporate social relationships in cyberspace to fully understand the social relational characteristics of emerging adults with SMI, and to develop programs that are particularly appealing to emerging adults with SMI.

Conclusion

Guided by the social convoy model and the multidimensional model of mental health recovery, this study explored the distinctiveness of emerging adults with SMI regarding social relational characteristics and their influence on mental health recovery. The findings provide partial evidence that supports the social convoy model by showing that the role of the family in mental health recovery differs between emerging and middle-aged adults with SMI. However, the findings also indicate a large degree of similarity between emerging and middle-aged adults with SMI. In particular, support from friends aids mental health recovery regardless of age. Social work interventions specifically designed for emerging adults with SMI should take into account both differences and similarities to better support the mental health recovery of emerging adults with SMI.

To the best of knowledge of the author, this is the first empirical research that explores the influence of social relationships on the mental health recovery of emerging adults with SMI by directly comparing them with those of middle-aged adults with SMI, using a multidimensional model of recovery. Despite the methodological limitations as a secondary data analysis, the current study paves the way for future social work research and practice by beginning to pay attention to the developmental distinctiveness of emerging adults with SMI. Future research should delve into the distinctiveness of social relationships among emerging adults with SMI. Understanding distinct characteristics will allow social work practitioners be cognizant of the needs of emerging adults with SMI and better support the recovery of emerging adults with SMI.

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APPENDIX A. Summary of Empirical Literature on Social Relationships and Mental Health Recovery of People with SMI of All Ages

Author	Purpose	Sample	Assessed social relational characteristics	Recovery measures	Key findings
Corrigan and Phelan (2004)	To test relationships between social support and the measures of recovery; recovery was assessed by each domains of recovery in Recovery Assessment Scale.	Consumers with DSM-IV Axis I diagnosis consistent with SMI (Schizophrenia, bipolar disorder, or major depression) AND functional disability. Age: M=41.3, SD=10.5	Size of support network Overall support Family support Friend support Professional support Network density Perception of network satisfaction Mutuality Obligation	Recovery Assessment Scale (RAS): five individual domain was assessed separately - Personal confidence and hope - Willingness to ask for help - Goal and success orientation - Reliance on others - Not dominated by symptoms	The size of overall support: personal confidence and hope (+), willingness to ask for help (+), goal and success orientation (+), reliance on others (+) Family support: reliance to others (+) Friend support (+), goal and success orientation (+), reliance on others (+) Professional support: goal and success orientation (+), reliance on others (+), symptom-depression (+), social withdrawal (-) Perception of network satisfaction: personal confidence and hope (+), willingness to ask for help (+), goal and success oriented (+), reliance on others (+), not dominated by symptoms (+), symptoms-depression (-) Mutuality: symptoms-depression (-) Obligation: social withdrawal (-)
Hendryx et al., (2009)	To examine whether involvement in activities has benefits beyond social networks and social support and whether activities interact significantly with support in their relationship to recovery.	People with schizophrenia, schizoaffective, bipolar, affective psychosis. Age: M=48.8, SD=14.8	Social support Social network	Recovery Assessment Scale (RAS): overall recovery was assessed by the total score of RAS.	Both social network size and social support were correlated to better recovery (+). The greater involvement in a wide range of activities is also related to better recovery, especially when levels of social support were lower (+).
Pernice-Duca and Onaga (2009)	To examine the comparative contributions of the structural and qualitative features of members' social	Clubhouse members Age: M=45.1, SD=9.6	Size (frequency) Family support Friend support Professional support Clubhouse support	Recovery Assessment Scale (RAS): overall recovery was assessed by the total score of RAS.	Recovery was related to the number of friend support (+), the number of clubhouse support (+), overall perceived support (+), reciprocity (+), and satisfaction (+): findings from cross-sectional data

Author	Purpose	Sample	Assessed social relational characteristics	Recovery measures	Key findings
	networks and how they relate to recovery		Support (overall) Reciprocity (overall) Contact (overall) Satisfaction (overall)		However, only the number of family support, overall perceived support, and reciprocity were related to recovery when tested one and a half years later: findings from longitudinal data
Pernice-Duca (2010)	To describe family support characteristics among consumers and to investigate which of these family support dimensions were important to autonomous and relational recovery domains as well as the recovery process as a construct.	Community mental health consumers who identified family as a source of social network support Age: M=43.0, SD=9.7	Family support Family reciprocity Frequency of contact Importance of family member Satisfaction with family contact Number of family	Recovery Assessment Scale (RAS): five individual domain was used In addition, among RAS subdomains, author separated out personal confidence and hope, and goal and success orientation for *autonomous dimensions*, and willingness to ask for help and reliance on others for *relational dimensions*	Personal confidence and hope was associated with social functioning (+), family reciprocity (+), satisfaction with family contact (+) Goal and success orientation was associated with social functioning (+), family support (+), family reciprocity (+) Willingness to ask for help were associated with family reciprocity (+) Reliance on others was associated with family support (+) Hierarchical regression revealed that reciprocity was the strongest predictor of recovery as a whole.
Roe et al. (2011)	To examine the relationships among social support, loneliness, and recovery	People with schizophrenia or schizoaffective disorder Age: M=43.2, SD=10.7	Social support-total Social support-family Social support-social Social support-others	Recovery Assessment Scale (RAS): - Total score - Hope - Help - Others - Symptoms	Magnitude of the self-report of subjective recovery was related to higher levels of reported social support and lower levels of loneliness (+).
Chou et al., (2012)	To investigate the strength and nature of the relationship between four social tie characteristics and three psychiatric rehabilitation outcomes.	Adults with SMI Age: M=44, SD=11	Perceived emotional support Tangible support Negative social exchange Social network orientation	Mental health recovery: mental health recovery scale	Mental health recovery was related to symptom distress (-), and tangible support (+)

Author	Purpose	Sample	Assessed social relational characteristics	Recovery measures	Key findings
Biegel et al., (2013)	To examine the contribution of family social network variables to recovery, and to better understand which family social network variables are most related to overall recovery and to specific recovery processes.	Clubhouse members with a self-reported mental illness Age: M=43.6, SD=11.6	Overall family support Criticalness of family members Satisfaction with the family relationships Positive relationship quality (quality of support given from the most supportive person) Negative relationship quality (undermining from the most supportive person)	Recovery Assessment Scale (RAS): total score and three of five individual domain were used - personal confidence and hope - willingness to ask for help - reliance on others	Recovery: Higher psychosocial functioning (3rd), greater overall family support (1st), and higher positive relationship quality (2nd) were associated with recovery (+). Personal confidence and hope (+): psychological functioning (3rd) , overall family support (1st) and positive relationship quality (2nd) Willingness to ask for help: positive relationship quality (+) was the only significant correlate of willingness to ask for help. Reliance on others: overall family support (2nd) and higher positive relationship quality (1st).
Chang et al., (2013)	To investigate the relationship between recovery and social, environmental, and individual factors.	Consumers with SMI Age: M=47.1, SD=not shown, instead, author reported age range of 20-68, median age of 47.96	Five types of social support; Emotional, Informational, Tangible, Positive social interactions, Affectionate support.	Mental health recovery measure (MHRM-R): assesses comprehensive recovery content, including overcoming stuckness, self-empowerment, learning and self-redefinition, basic functioning, overall well-being, new potentials, and advocacy/enrichment.	Social support, perceived recovery-oriented service quality, psychiatric symptoms, and illness length were significantly associated with recovery status (+). Participants with greater social support, better perceived recovery-oriented service quality, lower symptom severity, and longer illness lengths tended to have higher recovery score (+).

Note. (+)=positively associated; (-) negatively associated; M=mean; SD=standard deviation.

APPENDIX B. Summary of First Episode Psychosis (FEP) research

Study	Purpose	Sample and Design	Main Findings
Tempier et al. (2013) UK	To examine the relationship between network size, level of social support, family contact and remission To test mediation effects of perceived social support in the relationship among family contact, network size, and remission	N=123 (64% was male) Early episode patients with non-affective psychosis Mean age of 26.3 (SD=6.1) Longitudinal design: social support at baseline and recovery for later 18 months follow-up was used. Correlation, Poisson regression Path analysis for mediation effects	Controlling for age, gender, and treatment, perceived emotional support was related to remission; moderate (10-35) contact had an inverse relationship (more family contact less remission); In the reverse causation test, those who remitted early did not differ in perceived emotional support than who did not. Perceived emotional supports fully mediated the effects of network size and hours of contact on remission.
Norman et al. (2012) Canada	To assess the significance of initial social support and after one year of treatment in predicting functioning during the fourth and fifth years of follow-up	N=132 (out of 188; 77% was male) Previously untreated patients with affective and non-affective psychosis. Mean age of 25.2 (SD=8.0) Longitudinal design: social support measured at baseline and 1 year later; Recovery outcome during the 4-5 years later was used. Correlation, Regression analysis	Higher levels of both initial and one year later social support were correlated with higher functions indicated by weeks of full time employment and GAF. When controlling for confounding variables, social support at one year predicted functioning measured by GAF, total number of weeks in competitive work, and disability pension. Also, initial social support predicted disability pension receipt and GAF
Norman et al. (2013) Canada	To examine the relative importance of symptoms and components of social support in predicting subjective recovery from psychosis.	N=84 (69% were male) Patients in early intervention program with affective and non-affective psychosis Aged 17-48 (M=28, SD=7.4) Cross-sectional Stepwise regression analysis	Perceived relational evaluation was associated with all domains of recovery. Each domains of social support (i.e., appraisal, tangible, and sense of belong) uniquely associated with recovery. Perceived relational evaluation was the most important predictor.
Norman et al. (2012) Canada	To compare the importance of PRE and other types of social support in predicting self-esteem, depressive mood, anxiety, and anger-hostility	N=102 (71% was male) Patients in early intervention with psychosis and bipolar Mean age of 26.9 (SD=7.4) Cross-sectional Correlation, Regression analysis	Perceived relational evaluation (PRE) showed the highest correlation with self-esteem and mood. PRE was the only significant predictor of self-esteem, depression, and anxiety Both PRE and appraisal support independently predicted anger-hospitality.
Norman et al.	To assess the extent to which social support predicts symptom	N=113 (77% was male) Early psychosis patients with	Social support was not significantly related to any of the indices at entry, but higher social support is predictive of lower positive

Study	Purpose	Sample and Design	Main Findings
(2005) Canada	reduction and likelihood of re-hospitalization and to examine whether any such relationship can be explained by confounds.	schizophrenia spectrum disorders Aged 15-47 (M=25.8, no SD) Longitudinal: Social support at entry and symptoms at entry and three years later. Correlation, Regression analysis	symptoms at three years as well as fewer psychiatric hospitalizations during the three year follow-up, controlling for gender, age, premorbid adjustment, and duration of untreated illness. Exploration on differential impact of family and friends, both related to reduced positive symptoms. Whereas the family was related to admission, friends were not.
Alvarez-Zimenez et al. (2011) Australia	To identify significant predictors for groups with SPE independent of potential confounders	N=274 (out of 413; 70% were male) First episode psychosis patients in early intervention program Aged 15-30 (M=21.8, SD=3.4) Longitudinal: social support at entry and recovery for 7.5 years follow-up	No parental loss emerged as the strongest independent predictor of SPE.
Erickson et al. (1989) Canada	To examine social relationships of persons with first episode schizophrenia and affective psychosis.	N=175 (about 66% was male) First episode patients with affective psychosis and non-affective psychosis Aged 15-50 (M=25.2, SD=8.1) Longitudinal: social support at entry and recovery outcome18 months later. Hierarchical regression	More friends in the social network predicted better 18-month adaptive functioning for both psychotic patients after controlling for sex, age, and baseline adaptive functioning. Interactions found: the number of kin in the network was negatively associated with outcome for people with schizophrenia but not for people with affective psychosis. Greater availability of acquaintances was positively associated with outcome for schizophrenia patients but not for people with affective psychosis
Erickson et al. (1998) Canada	To study the relationship between social support and the 5-year outcome of people with first episode psychosis and affective psychosis.	N=109 (68% was male) First episode patients with affective psychosis and non-affective psychosis Mean age of 22.7 (SD=5.3) Longitudinal: social support at entry and recovery at 5 years later. Correlation	The number of non-kin in the social network at or about the time of illness onset predicted 5-year adaptive functioning. Premorbid social competence, as indexed by the highest level of social participation in the teenage years, was not related to. Kin & non-kin are differently related to the outcome.
Dozier et al. (1987) USA	To examine relationship between network density and hospitalization. Expected quadratic relationship: high and low level of density is associated with more frequent	N=30 (no information on gender) Young adults identified as “difficult to treat” Schizophrenia, bipolar, borderline personality disorder Aged 21-40 (M=31, no SD)	Network size ranged from 2-49 with an average of 16 persons, and in density from 0.17-1, with an average of 0.51 Curvilinear (squared) relationship between density and time in hospital found: the fewest number of days in the hospital was obtained by patients with more moderate levels of networks density. Patients with networks of very low density and high

Study	Purpose	Sample and Design	Main Findings
	hospitalization while moderate is lower hospitalization.	Longitudinal: social support and recovery during the previous year.	density obtained higher number of days in hospital. Network density is independent of size.
Mattsson et al. (2008) Sweden	To examine the relationship between financial strain and social network and the association to five year outcome.	N=135 (48% was male) First episode psychosis patients Mean age of 25.8 (SD=4.9) Longitudinal: Time 1 social network variable and Recovery at 5 years later (Rank) correlation, Stepwise linear regression	Quantitative social network and qualitative social network all had a unique contribution to outcome group. Recovered group had better quantitative and qualitative social network.
Kalla et al. (2011) Finland & Spain	To examine whether the 12-month outcome differ between the Finnish and Spanish patients with FEP and to explore which of the social adjustment variables are associated with outcome	N=68 (47% was male) First episode patients with non-affective disorders Aged 16-44 (M=27.1, SD=6.5 in Finland, M=28.0, SD=6.9 in Spain) Longitudinal: social support at baseline and outcome of 12 months later were used. Correlation	For both groups: baseline characteristics of weaker social network, more psychological dependence on their family of origin had poorer outcome. Finnish: fewer social contacts with friends, less social recreational activities and less stability in couple relations in the year before the admission related to poor outcome. Spanish: lower level of parental criticism had a poorer outcome.
Albert et al. (2011) Demark	To investigate the predictors of good outcome after first-episode non-affective psychosis and the clinical and social trajectories of those that recover.	N=255 (56% was male) First episode psychosis patients Mean age of 26.0 (SD=6.0) Longitudinal: Social support at baseline and recovery at 5 years later. Logistic regression	PAS social functioning and growing up with both parents were associated with recovery.

APPENDIX C. Social relational and recovery measurements used in the identified FEP research

Study	Social support measures	Recovery measures
Tempier et al. (2013)	• ***Perceived emotional (+) and practical support (ns):*** Measured by Significant Other Scale (SOS). Patient identifies relationships with family, friends, and co-workers that are sources of practical and emotional support. The scale consisted of four questions on practical (2) and emotional support (2) using 7 point Likert scale. Calculated perceived practical and emotional support by summing the two questions in each dimension. • ***Network size (ns)***: summing the number of relationship identified. Three categories of 0-1 person, 2 persons, and 3 or more persons. • ***Family contact (m)***: the number of hours of contact with the family, classified into three, <01, 10-35, and >35 per week.	• Remission: full, partial, and no remission assessed by positive evidence in two consecutive months of having no psychotic symptoms ("full remission") and an improvement ("partial remission"). The number of consecutive months in remission was used to represent recovery.
Norman et al. (2012)	• ***Social support (+):*** Wisconsin Quality of Life scale-provider version completed by case manager. Included three items; overall assessment of support from family and friends; the extent to which the individual has friendships; quality of relationship with family members. (Not explicit but it seems that total score is used for the analysis. No information about scaling)	Three indicators of functioning • Global Assessment of Functioning (GAF) • Total number of weeks of full-time competitive employment or full-time study. • Weeks receiving a disability pension during the fourth and fifth years of follow up assessed by Life Chart Schedule (LCS)
Norman et al. (2013)	• ***Appraisal (+), tangible (+), and emotional (+) support:*** measured by the Interpersonal Support Evaluation List (ISEL). Perception about the availability of resource (appraisal), availability of help (tangible), and sense of social belongingness & signs of being respected and valued by others (emotional) • ***The Perceived Relational Evaluation Scale (PRES) (+)***: 2 parallel 24-item scales with regard to family and friends; respondents evaluate the quality of relationship with them, using 7-point Likert scale.	• Perceived recovery: measured by Modified Engulfment Scale (MES): the extent to which an individual's self-concept and social roles are dominated by his or her mental illness. 24 items • Recovery Assessment Scale (RAS): 24 items representing personal confidence and hope, goal and success orientation, not being dominated by symptoms, reliance of others, willingness to ask help.
Norman et al. (2012)	• ***Appraisal, tangible, and emotional support (ns):*** measured by the Interpersonal Support Evaluation List (ISEL). Perception about the availability of resource (appraisal), availability of help (tangible), and sense of social belongingness & signs of being respected and valued by others (emotional) • ***The Perceived Relational Evaluation Scale (PRES) (+)***: 2 parallel 24-item scales with regard to family	• Self-esteem: Rosenberg self-esteem scale. Profile of Mood States (POS) was used to measure: • Depression • Anxiety • Anger and Hostility

	and friends; respondents evaluate the quality of relationship with them, using 7-point Likert scale.	
Norman et al. (2005)	• ***Social support (+):*** the Wisconsin Quality of Life Scale –Provider questionnaire (WQL-P) by case manager: four items – frequency of attendance at social organization such as church, club, or interest groups, one specifically focuses on the extent to which the individual makes and keeps up friendships and another reflects the quality of relationships with family members. Total score was used.	• Symptom: the Scale for Assessment of Positive Symptoms (SAPS) and the Scale for Assessment of Negative Symptoms (SANS) • Admission: the number of hospitalization for the three years
Alvarez-Zimenez et al. (2011)	• ***Parental loss(ns)***: having both parents alive versus death or loss of contact with one or both parents	• Single psychotic episode: experienced only one discrete psychotic disorder over the 7.5 year follow-up and achieved complete remission
Erickson et al. (1989)	Interview Schedule for Social Interaction was used. • ***Social network (+)***: the number of family, the number of friends • ***Availability of social resources (ns)***: # of contact with family, friends, and acquaintances. Coded availability of close and confiding relationships • ***Perceived social support (ns):*** adequacy of close and confiding relationships, adequacy of acquaintances.	• Adaptive functioning: The DSM-III axis V rating which measured the highest level of social and occupational functioning in the 9 months leading up to the follow-up interview
Erickson et al. (1989)	Interview Schedule for Social Interaction was used. • ***Social network (+)***: the number of family, the number of friends • ***Availability of social resources (ns)***: # of contact with family, friends, and acquaintances. Coded availability of close and confiding relationships • ***Perceived social support (ns):*** adequacy of close and confiding relationships, adequacy of acquaintances.	• Adaptive functioning: The DSM-III axis V rating, a 7-point scale rating occupational and social functioning (1=grossly impaired, 4=fair, 7=very superior) in the month prior to the 5-year follow-up.
Dozier et al. (1987)	• ***Social network size (ns)***: the number of individuals listed as important by a patient. • ***Network density (m)***: the proportion of linkages among network members when all possible linkages are considered. Density is calculated by the formula – Density=L/N(N-1)/2, where L is the number of actual linkages among network members and N is the network size.	• Time in hospital: the number of days a patient was hospitalized during the previous year.
Mattsson et al. (2008)	• ***Social network (+)***: availability of attachment (AVAT-qualitative network) and availability of social integration (AVSI-quantitative network). Scores were calculated according to the author's instructions and ranged between 4-24 for AVAT and 0-15 for AVSI	• Recovered: living a normal life, with or without antipsychotic medication and with no need for daily support from professionals, GAF>60 for at least 6 months and they had to have worked or studied independently at least on a half-time base.

Kalla et al. (2011)	• ***Family relations (m)***: living with family of origin, psychological dependence on family of origin, parental criticism, parental emotional over-involvement, 4 point Likert scale (0-3) • ***Strength of social network (m)***: a sum score from frequency of contacts with friends, type of recreational activity (social or solitary), and stability of couple relations measured 0-10.	• BPRS: type and degree of symptoms • GAS: global assessment of scale. • Grip on Life: global assessment of psychosocial adjustment-patients efforts to achieve the goals and modes of satisfaction with interpersonal relationship, social life, and occupational activity of adult persons. Patients though and hope about future. Dichotomized.
Albert et al. (2011)	Premorbid adjustment scale (PAS): range 0-1 higher is worse. • ***PAS social functioning (+)*** • ***PAS school functioning (ns)*** • ***Growing with both parents (+)*** • ***Having a partner (ns)*** • ***Number of friends (ns)*** • ***Number of family contacts (ns)***	• Recovery: stable remission of both negative and psychotic symptoms during the last 2 years, had not been hospitalized or lived in a supported housing during the last 2 years and have GAF<60, have a job or was studying.

Note. Symbols next to measurement indicate statistical significance: (+) positive association with recovery, (-) negative association with recovery, (m) mixed or curvilinear relationship with recovery, and (ns) not statistically significant.